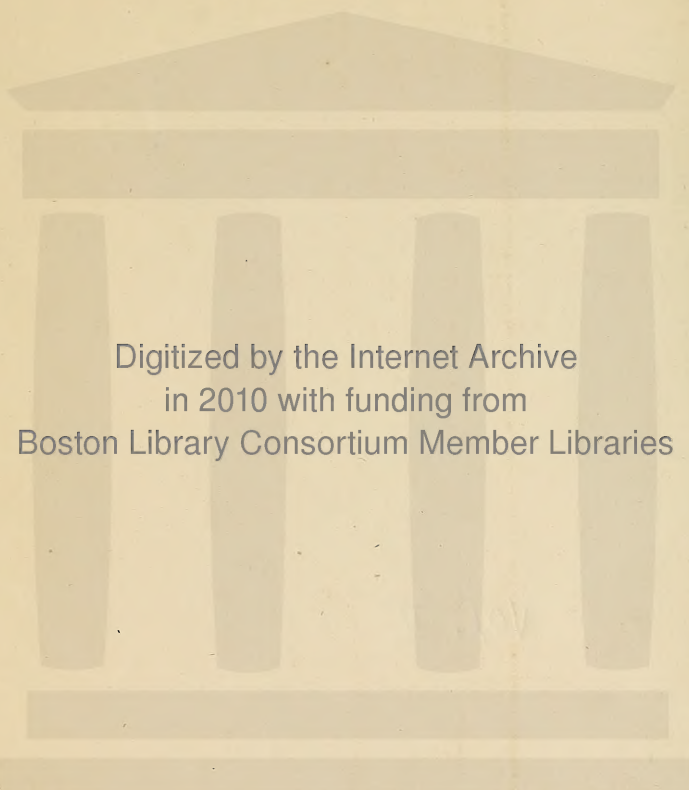


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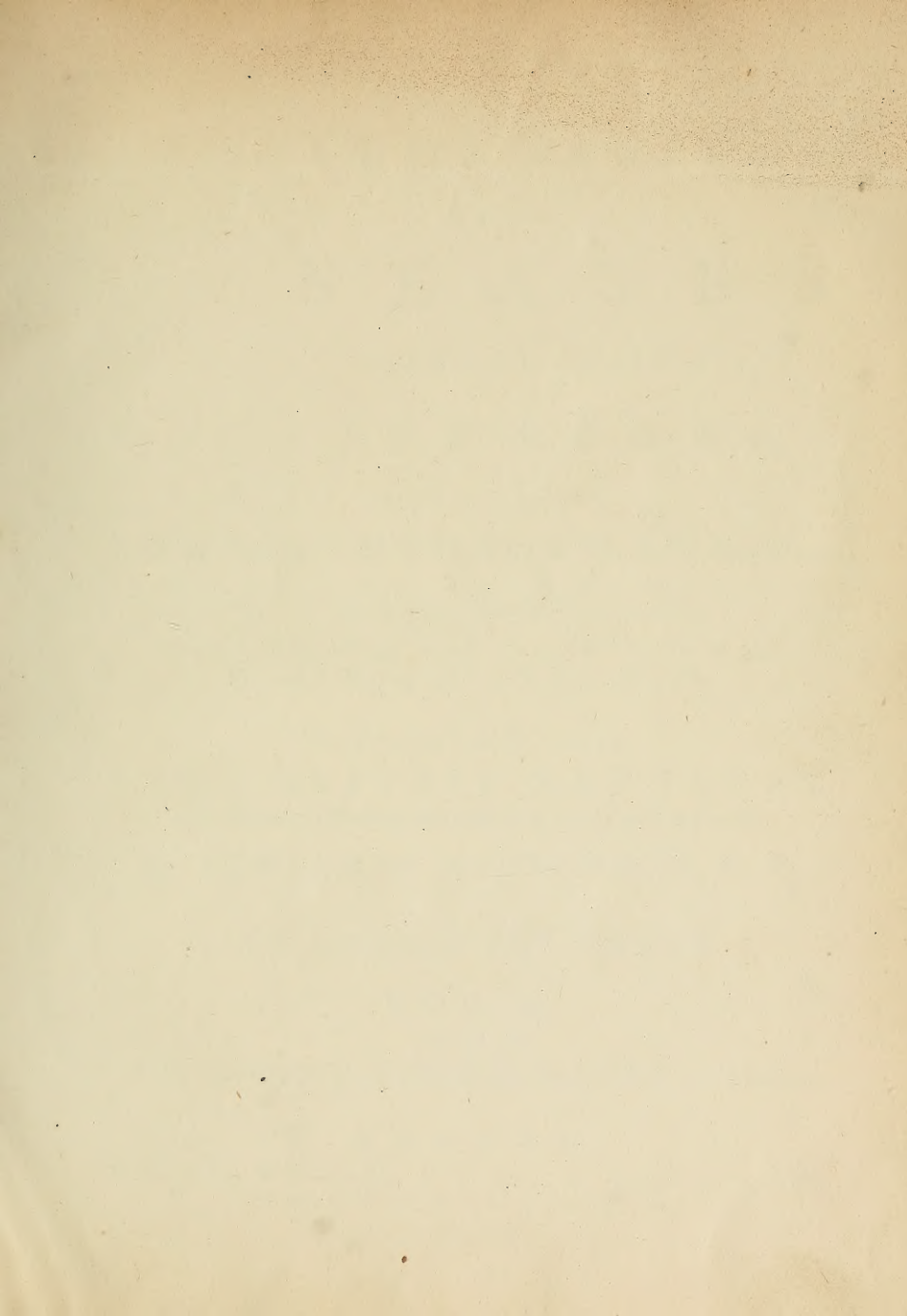
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MORGAGNI'S
CAUSES
OF
DISEASES

VOL. II



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THE
SEATS and CAUSES
OF
DISEASES

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INVESTIGATED BY ANATOMY,
IN FIVE BOOKS,
CONTAINING
A Great Variety of DISSECTIONS, with REMARKS.

TO WHICH ARE ADDED
Very ACCURATE and COPIOUS INDEXES of the
PRINCIPAL THINGS and NAMES therein contained.

TRANSLATED from the LATIN of
JOHN BAPTIST MORGAGNI,
Chief Professor of Anatomy, and President of the University at PADUA,
By BENJAMIN ALEXANDER, M. D.

IN THREE VOLUMES.

VOL. II.

771

L O N D O N,

Printed for A. MILLAR; and T. CADELL, his Successor, in the Strand;
and JOHNSON and PAYNE, in Pater-noster Row.

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T O

D^R. R U S S E L L.

S I R,

IT gives me a secret, and a sincere, pleasure, that I have the honour of addressing myself to You on this occasion. I have been long-wishing for an opportunity of discharging, in some measure, the debt of gratitude and respect which I owe to Your Character. And I might have waited still longer, for such an opportunity, had not the occasion before me, which I gladly embrace, presented itself.

Various are the views in which Dr. RUSSEL stands intitled to my esteem, I mean as the Preceptor, the Physician, and the Friend. In each of these departments have his Humanity and Capacity been conspicuous. And to Him, in each of these Characters, do I stand almost equally indebted. From His examples, as a Preceptor, I long had the pleasure and advantage of receiving the most excellent maxims in the Practice of Medicine, and of learning an

accurate Attention to Diseases. And that practical Skill, which I had often been witness to in others, I have been happy enough to experience in myself. Nor is it without a peculiar pleasure that I express my gratitude on this head, as well because it is the ONLY TRIBUTE I can be allowed to bestow, as because the kind offices of Friendship went hand-in-hand with the endeavours of the Physician.

The Public, then, Sir, will at once be a judge of the propriety of this Address. The Public, which is always grateful itself, and respects that principle in individuals, will see how just and indispensable it is to dedicate to You a part of the Labours of that Life, which You have been thus instrumental in preserving. That You may live happily and long, in the exertion of that Medical Skill, for the benefit of your fellow-creatures—and that Your friends may, consequently, be long indulged with that condescension, and readiness to oblige, which I have so often experienced at Your hands—are the earnest wishes of

Your sincere Friend,

And respectful humble Servant,

BENJ. ALEXANDER.

C O N T E N T S

OF THE

S E C O N D V O L U M E.

BOOK III. Of DISORDERS of the BELLY.

LETTER

XXVIII. *O*F preternatural Hunger; of starving to Death; and of injured Deglutition.

XXIX. *O*f the Singultus; of chewing the Cud in Men; and of Pain in the Stomach.

XXX. *O*f Vomiting.

XXXI. *O*f intestinal Profluvia, without Blood, or Bloody.

XXXII. *O*f Costiveness; and of the Piles.

XXXIII. *O*f the Prolapsus of the Intestine Rectum.

XXXIV. *O*f the Pain of the Intestines.

XXXV. *O*f the same.

XXXVI. *O*f Tumor and Pain in the Hypochondria.

XXXVII. *O*f the Jaundice; and of bilious Calculi.

XXXVIII. *O*f the Hydrops Ascites, Tympanites; the Dropsy of the Peritonæum; and others which we call incised Dropsies.

LETTER

XXXIX. *Of the remaining internal Tumours of the Belly.*

XL. *Of Pain in the Loins.*

XLI. *Of the Suppression of Urine.*

XLII. *Of the Difficulty of Making-water; the Ardor Urinæ; and other Disorders in which the Urine is concerned.*

XLIII. *Of Herniæ.*

XLIV. *Of the Gonorrhœa.*

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XLVI. *Of the Impediments to Venery; and of Sterility in both Sexes.*

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XLVIII. *Of false Pregnancy; of Abortion; and of unsuccessful Delivery.*

E R R A T U M.

Page 3. Line 1. for Letter XXVII. read XXVIII.

THE
SEATS and CAUSES
OF
DISEASES

INVESTIGATED BY ANATOMY..

BOOK the THIRD,

Which treats of DISORDERS of the BELLY..



LETTER the TWENTY-SEVENTH,

Contains some Observations on preternatural Hunger, and upon Death from the same Cause: and afterwards treats of injur'd Deglutition.

1. **O**F all the four books, into which the *Sepulchretum Anatomicum* is divided, the third is by far the longest, inasmuch as it comprehends the disorders of all parts whatever, that relate particularly to the belly, and not only in the male body, but in the female also. For which reason, I shall now take the more pains to study brevity, as far as I am able; which I am under a necessity of doing, if I would, at length, ever put a finishing hand to this work, that I have undertaken for you. And there seems to me, to be the most room for doing this, in those several subjects, which are spoken of separately, in the four first sections, "Loss of appetite, preternatural hunger, morbid thirst, and injur'd deglutition." For if you except the last, there is not one dissection, which has been perform'd by Valsalva; or by me, that relates, in particular, to these arguments. And lest you should be surpriz'd at this, only consider, how seldom it happens, that any person dies, whom a lost appetite for food, or too great hunger, or thirst has consum'd, without some violent disorder being joined with it, or being the consequence of it. Wherefore, if where I have treated of this violent disorder, or shall treat of it, you find that these disorders are, at the same time, taken notice of; what occasion is there, that those things, which are necessarily said, or to be said, in other places, should be needlessly repeated here? Turn over, I beseech you, these three first sections of the *Sepulchretum*. You will see that a languid appetite, or a deficiency thereof, was generally join'd with great injuries of the viscera, that is with great disorders; and that great thirst was generally join'd with fevers, with inflammations, and with dropsies. For which reason Bonetus tells us, that some of the same observations are again produc'd by him, in other places, and even some of those, in regard to which he makes no such declaration, are reproduc'd in other places. But this is less surprizing, than that the same observations should be again repeated, in one and the same section. For in the first section, the third, and fourth, observations are no others than those

which are produced in article the seventh, under the ninth observation, and article the first, under the tenth observation. Nor in the third section, in like manner, are the third, and fourth, observations, any other than what are again given; under the fifth observation, article the seventh and third, as those also are one and the same, that are found under observation the seventh, article the second, and in the additamenta, under observation the fourth, article the first, besides others which you perhaps will remark.

2. These things, however, I do not say of the second section. Yet one thing I say, that this excessive hunger was, also, join'd together with some considerable disease, as either the various symptoms, here and there, in the living patients, or the disorders in the viscera of the bodies after death, demonstrate. Besides, if you except some certain conformations, that are very rare, and those such as were impress'd on the very stamina of the body, as for instance, the pylorus being deficient, or wider, and, at the same time, much shorter than is natural, and the tube of the intestine, being less distorted into folds, and circles, to which I wonder these two other causes, that are so well known, one of which was found by Ruysch to be adventitious (*a*), and the other by Dionis to be congenial (*b*), are not added; I say, if you except these, in most other observations there will be reason to doubt, whether a true, or a false, cause of unusual hunger be advanced; as when that cause is sought after in the spleen, as if it discharg'd something into the stomach (*c*), and when it is supposed to consist in the enlarg'd state of the stomach (*d*), which you will say, was rather the effect of too great a quantity of food being taken in, than the cause, just as in the first section (*e*), you would suppose, that the very small capacity of the contracted stomach, in a man who had eaten nothing for a long time, was the effect of taking in no food for so long a time, and by no means the cause why the patient could eat nothing. And in regard to the spleen, and the magnitude of the stomach, you will doubt so much the more, by and by, when you have read the appendix after the seventh observation, and the tenth observation itself. But will you believe the unusual magnitude of the liver (*f*), to have been the cause of excessive hunger, either because it cherish'd the stomach more by its warmth, or because it separated a greater quantity of bile? or rather an effect, because from an increas'd quantity of nourishment, this soft viscus had been much increas'd in its size, just as it happens in geese that are full-fed? and if you think thus, in regard to the liver, will you not judge nearly the same of the pancreas also (*g*)? as if truly, because it was furnish'd with two ducts, which went to the intestines in distinct places (an appearance that has been, more than once, found in other bodies, and even in those that had not been troubled with a morbid hunger) the viscus must, for that reason, secrete a much greater quantity of juice, which circumstance was not to be argued from the number of the ducts, as these might be small in proportion, but entirely from the more enlarg'd state of the viscus, which was, in other respects, found, if its state was really en-

(*a*) Obs. anat. chir. 74.

(*b*) Anat. de l'homme demonstr. 2.

(*c*) Obs. 4. & seq.

(*d*) Obs. 1. & 8.

(*e*) Obs. 5.

(*f*) Obs. 2.

(*g*) Obs. 13.

larg'd. Finally, to omit other things, should it have been said, that the "pica had arisen from the stomach being almost in a sphacelated state?" certainly not; for this mortal disposition of the stomach, as it was in a woman, who was just at the point of death, could not, without doubt, have existed, at the time "when she was fond of eating cinders and ashes."

3. But do you approve of nothing, in this whole section, you will say? yes: I do approve of many things, notwithstanding I could wish, there had been a better choice, in some things, and in others, a more nice judgment. There are, also, still other cases, that I cannot admit without some hesitation: and others on the contrary, that I am even able to confirm. You see, for instance, what is said in the ninth observation, of some lice being devour'd by an istic boy, so that they grew in the stomach, to "a monstrous magnitude, and to a very considerable multitude," and brought on "an insatiable hunger, by consuming the aliment" taken in. Do these creatures then, like to feed upon the same kind of nourishment as men? and do they thrive very well therefrom? or is the stomach a very proper place for them to live in, so that they shall neither be overwhelm'd with the liquors taken in, nor carried away to the intestines, together with the food in which they are so greedily entangled; and is it even a proper place for them to propagate in? In short, if they had really liv'd there, would they not rather have quickly brought on an intolerable erosion, in a viscus of this delicate nature, and a sense of erosion, rather than of hunger? and yet no erosion is mention'd, as having been seen in the dead body. Wherefore, for more than one reason, the observation that is adjoin'd in the scholium, and is given, in another place, under this title (*b*), "A pain of the stomach, from bladders full of lice being affix'd to it," may seem somewhat less incredible: although I am much inclin'd to suspect, that in both of the cases, some little bodies, or if you will have it so, some little animals, were seen, which in some measure resembled lice, especially as it is clear, that he who relates the second, was not himself present; and he who related the first, has not expressly said that he was himself present; and neither of them, whether the lice were at that time still alive, in order to show us from the motion, at least, that they were animalcules. But as I observ'd, after I had written these things, that the case seem'd credible, to more than one of my learned friends; I would, for that reason, so much the more have you remember, that I do not say these things, as a person who absolutely denies the truth of the facts, but rather as one who doubts thereof. On the other hand, when in the appendix, which is subjoin'd to the scholia of the observation, the question is of worms in the human body, causing excessive hunger, by their peculiar magnitude, or number, there is no reason for hesitation thereon. For these creatures live in their proper places, and feed on their natural provision: and if their place, and provision, be not in proportion to their magnitude, or at least to their multitude, it is evident that the animal, in which these worms are, being defrauded of its nourishment, must be often troubled, with an incredible hunger, and often even with an incredible thirst. For both of these circumstances have not only been, fre-

(*b*) L. hoc 3. f. 6. obs. 38.

quently, observ'd by others, but by me also, and particularly in that young whelp, which I accurately dissected, and in which, though it died after being troubled with these symptoms, I could no where find any morbid appearance besides a great number of worms, as I have written in the letter, which was formerly publish'd by our Vallisneri (*i*). So likewise, when the observations of Bontius are pointed out (*k*) "of excessive hunger, and canine appetite," as it is call'd, being the consequence of infarctions in the mesentery, they bring to my mind what Albertini had formerly related to me, that he, in some bodies, who had labour'd under this kind of disorder, and particularly in a boy, who was hungry to such a degree, as to be frequently seiz'd with swoonings from that very cause, had found the glands, that lie in the belly, to be tartarized, as the common phrase is, so as to turn the edge of the knife by their hardness. But whether there was an abdominal flux in these persons, and of what kind it was, when the fresh supplies of chyle were continually intercepted by the mesentery, or whether there was none at all; for in Bontius (*l*) you will read that there was a lenteria; I do not certainly remember.

4. I am also pleas'd with those dissections, that are produc'd in the last place (*m*), of two men who were kill'd, by a long abstinence from meat, and drink, but should have been still more pleas'd, if, as they show "that the veins, and arteries, were surprizingly emptied, and that from the vena cava, scarcely two or three spoonfuls of blood flow'd out, and from the aorta, none at all;" so, in like manner, they had shown other things, that are worthy of observation, as for instance, the ages of these men, their constitution, habit, strength, and the exact number of the days of their abstinence, the symptoms which preceded their death, the state of their viscera, and other things of this kind. Which accuracy would have been extremely useful, in the first of these men particularly, as he was, "in other respects, of a sound and healthy body," when he took the resolution of killing himself with hunger. For those who, in consequence of disease, or the torture of it, are brought to such a state, as to be able to take no nourishment, can teach us nothing certain, either living, or dead, as you are, without doubt, entirely ignorant, how many days this disease, itself, might, perhaps, have taken away from life, and what unusual appearances, the privation of nourishment had, of itself, brought upon the viscera. So in the works of the celebrated Peyerus, I mean the son, we have the dissections of a man, and a woman (*n*); who were starv'd to death with hunger; but in both of them, we read of morbid appearances, of the internal parts, and of such a kind, that when we acknowledge these to have related to disorders, we do not very greatly wish for those other informations, which I mention'd just now. On the contrary, most of these circumstances are accurately taken notice of by the very excellent Fantonus (*o*), in a woman who obstinately refus'd taking food for fifty days, when she died. But as she did, however, take a little twice, and which is of still more consequence, made use of water by way of drink, although "in very small quantity," she is by no means to be compar'd with

(*i*) Consideraz. int. alla generaz. de' vermi.

(*k*) Obs. 12.

(*l*) Vid. Sepulchr. l. 3. f. 10. obs. 1.

(*m*) Obs. 18. § 1. & 2.

(*n*) Obs. anat. 1. & 7.

(*o*) Dissert. anat. renov. 1.

the man, of whom I made mention in the first place. For how much the drinking of water, may contribute, by diminishing the scarcity of the humours, and tempering their acrimony, which are the two things most injurious to hungry persons, to lengthen out their lives, is proved by the experiments of Redi (*p*), who keeping many capons without any food, observ'd that of those to which he, also, denied drink, not one of them liv'd beyond the ninth day, whereas that, to which he gave as much water, as he would have, which he drank, very greedily, and frequently, for the first sixteen days, lived more than twenty days. Nor indeed do I believe, although Pomponius Atticus (*q*) ended his life, together with his very violent disease, within the fifth day of his abstinence from food, it would first have happen'd, "that the fever left him all at once," and the disease have begun to be more mild, "if he had abstain'd" from drink also, "for the space of "two days," as he had "from food." However, whether that short alleviation of Atticus, is, perhaps, to be explain'd, from the forty-seventh aphorism of the second section, of Hippocrates, as if the pus had then ceas'd to be prepar'd, which afterwards "burst out by the loins," or whether it is rather to be attributed to his abstinence from food, since Redi (*r*) affirms that it is incredible, how beautiful the viscera of those animals are found to be, that have died of hunger, you are quite at your own liberty to determine. I will confirm to you another maxim of Redi, in regard to those things which I have above thought deficient in observations of this kind, by a certain experiment of Valsalva's. Much, says Redi (*s*), do the age, and strength, of animals contribute to make them bear up the longer under hunger. And the following is the experiment of Valsalva, which is written with the accuracy, and care, that we require.

5. A dog was taken away from his mother's dugs, a little after being whelp'd, and kept from all kind of nourishment. On the third day of his hunger, he began to be attack'd with convulsive motions in his whole body, sometimes more violent, sometimes more mild. He died on the fourth day. The belly being open'd, the gall-bladder was found to be very full of bile. The thorax being open'd, the lungs, in the right side, were ting'd with a very black oblong spot: the auricles of the heart were much dilated by coagulated blood: of which the ventricles were also full. And in all the sanguiferous vessels likewise, but particularly in the veins, whatever blood there was, had become coagulated, so that it was no where found to be fluid. At length, the cranium being cut through, the cerebrum was found to be soft, and flaccid, and not very well distinguish'd into two substances, so that the cortical part could be known from the medullary. Both the tympana of the ears, being full of a pellucid jelly, had the little bones exactly well-form'd indeed, but, even at that time, preserving their membranous softness.

6. The convulsive motions, which had preceded death, are, in some measure, like those, that Valsalva had observ'd, before the death of that woman (*t*), who had abstain'd six days from meat, and drink. But those

(*p*) Osservaz. int. agli animali viventi, (*r*) Osserv. cit.
&c.

(*q*) Vid. ejus vit. apud Corn. Nep.

(*s*) Ibid.
(*t*) Epist. 17. n. 25.

appearances that were in the whelp after death, are most of them proper, rather to the fœtus, than to the animal, who has died of hunger, yet some of them are common to both, as the quantity of bile, by reason of the gall-bladder not being compress'd by the stomach, or the nearest intestine, both of which were of course flaccid. But, also, whatever bile flows down from the liver to the intestines, so much the more readily appears therein, as it is not hid by a mixture with the food that is taken in. Nor does reason only confirm this, but observation also, as well in almost all those animals, which Redi had kill'd by hunger, as we know from the testimony of Caldesi (*u*), as in men who were destroyed by abstinence, which the joint observations of Peyerus (*x*), Fantonus (*y*), and Haller (*z*) demonstrate. It is also shewn by reason, (as by long abstinence, from all kind of meat and drink, the humours of the body become very acrid, and tend to putrefaction) how easily it may happen, that the bodies of those who die of hunger, shall smell very strongly, as is asserted by a very celebrated writer, of the bodies of men, but particularly of dogs: which mark added to others, would certainly be useful, not only to those who desire to know, whether some men were carried off more by hunger, or by disease; but also, some times, to those, who I see doubt whether the dogs on which experiments have been made, have died of these experiments, or of hunger. But I will now leave these considerations, to those who shall hereafter make the experiments, and pass over other things also, to insist upon that which I promised you. How long the dogs lived, which Redi (*a*) had thus kept, from all kind of meat and drink, you will understand from hence, that some of them reach'd to thirty-four days, others to thirty-six, and that a little whelp seem'd likely to live for many more days, if he had not thrown himself headlong from a very high window. But although this was in fact a small whelp, he nevertheless was not just born, as that was which, according to the observation of Valsalva, could not live over the fourth day. Indeed, that there may be wonderful varieties in these things, I the more readily confess, the more I attend to the great number of different instances of long abstinence, which are both learnedly produc'd, and accurately consider'd, by that very learned man Beccarius (*b*). Nevertheless I should suppose, that what is deliver'd down by Hippocrates (*c*) pretty well agrees with truth, if you except some very rare constitutions of bodies, and circumstances of cases, I mean that "young persons" bear fasting "with less ease, and children least of all," which, on the contrary, they bear more easily, who "are middle-ag'd, and old men the most easily of all," unless, perhaps, they are quite decrepid with age, as Celsus wisely (*d*) interprets Hippocrates, by giving his opinion in the following manner: "men of a middle age bear abstinence very easily, but young men not so well, and children, and men very far advanc'd in years, cannot bear it at all;—but that person is most of all under ne-

(*u*) Osservaz. int. alle Tartarughe.

(*x*) Obf. 7. cit. supra ad n. 4.

(*y*) Diff. ibid. cit.

(*z*) Ad Boerh. Praelect. § 98. not. 2. &
 •pusc. Pathol. obf. 24.

(*a*) Osservaz. cit. supra ad n. 4.

(*b*) Vid. de Bonon. Sc. Acad. t. 2. p. 1.
 inter Medica.

(*c*) Sect. 2. aph. 13.

(*d*) De Medic. l. 1. c. 3.

" necessity

"cessity of taking food, whose growth is most advancing:" which Hippocrates, also, had expressly taught, in the next aphorism (*e*).

7. And the opinion of Hippocrates would be surprizingly well confirm'd by one story, if this were really, as Cardan (*f*), and Zambeccarius (*g*), have hastily suppos'd, a history, and not a poetical fgment of Dante (*b*), of the count Hugolini, and his four sons, who were starved to death with hunger (which one fact is undoubted), so that all of them lived some days, but the boy, of three years, died on the fourth day, and the other children, who were somewhat older, or almost young men, on the fifth, or the sixth day, and last of all, the father, as he was of a middle age, or at least only just entering upon old age, died on the eighth day: all which circumstances were, without doubt, imagin'd by the poet himself, in conformity to the aphorism of Hippocrates, the author being at that time very learned, or at least in conformity to probability, as the poet himself, sufficiently shews in that place, though these worthy men have not attended to it, where he introduces the spirit of Hugolini relating these things to him, which, as he expressly says, "he could not have been informed of" by any other means, inasmuch as they had happen'd in the dark recesses of a high tower, the keys of which were thrown into the river by the enemy, immediately after they had been shut up therein.

If therefore you happen to want a number of histories, to prove the several parts of the aphorism of Hippocrates, as they are explained by Celsus, I will take notice of some from the Roman history, which come into my mind, as I am writing. I have said above (*i*), that Pomponius Atticus, being sick, died on the fifth day of his abstaining from food. But Sextius Baculus, as you have it in Cæsar's Commentaries (*k*), although he was so far sick, "as to have been without food for "five days," was so far from death as to take up arms and repel the enemy, inasmuch as he was at such a flourishing time of life, as, not long before, to have perform'd the office of first centurion, to the legionary soldiers; but Atticus had completed his seventy-seventh year: so we must not be surpriz'd, that Suetonius (*l*), when he spoke of Tiberius having "abstain'd "from food, for the space of four days," did not only not add what injury he receiv'd therefrom; but even asserted, that Tiberius "immediately went "down to Ostia"; for Tiberius was at that time of a middle age, and a firm constitution.

To these, you will, yourself, add examples of younger persons: nor will you easily find, I believe, when you come to children, and infants, any who have born fastings of this kind, in such a manner. Nor indeed would I have you object to me, from the observation of Fernelius (*m*), the instance of a fœtus who seems, as a really memorable example, to have born a want of nourishment for the space of two months. For notwithstanding the mother, who "in the opinion of all those that attended her, had "swallowed down no meat, nor drink, for the whole two months," at length, in the latter end of the fever, of which she died, "brought forth a

(*e*) 14.

(*f*) Com. in cit. Aph. 13.

(*g*) Experim. circa diversa e viventib. exsecta.

(*h*) Infern. cant. 33.

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(*i*) N. 4.

(*k*) De Bell. Gall. l. 6. c. 38.

(*l*) De duodecim Cæsariis. l. 3. c. 10.

(*m*) Pathol. l. 6. c. 1. in fin.

"child that she left surviving;" yet as often as ever she got down food, or drink, quite to the lower part of the œsophagus, which she immediately brought back, and threw up, it is to be suppos'd, that some portion of the ingesta, which were going backwards and forwards, had always entered the mouths of the absorbent vessels, in the mouth, the fauces, and the œsophagus, and that by these means, this woman was preserv'd for so long a time, nearly in the same manner as another gravid woman mention'd by Hildanus (*n*), who was kept alive, for the space of six weeks together, with her foetus, by nourishing glysters alone. And, indeed, it is not absurd to suppose, that the tubercle with which the mouth of the stomach was shut up, as appeared in her body after death, had not been so large while she was living, as quite to obstruct that orifice, unless, perhaps, in the latter part of her life; for disorders of this kind are continually increasing, and consequently extend themselves to such a degree, as to reach those parts, that they did not, sometime before, reach.

8. This observation of Fernelius brings to my mind the fourth section of the Sepulchretum, in which even this very observation is (*o*), of which section I made such mention in the beginning (*p*), as to discover, that I was not wanting in observations relative thereto, or in other words, to impeded deglutition. And certainly, I should not be at all deficient, if I thought proper to imitate what is done, even in this section. For you will see, that the fourth observation in it, differs from the seventeenth, only by being related in somewhat fewer words: and you will wonder still more, at the same thing taking place in the nineteenth, if compar'd with that to which it is immediately subjoin'd, I mean the eighteenth. And in the additamenta themselves, does not one part of the second observation repeat, in so many words, what had been already given, with sufficient fullness, in the same section, in a part of the scholium to the eighth observation? I however shall not repeat here, even those which I have produc'd in other letters, from Valsalva's observation, or my own. But whatever of this kind remains, I will give you here; those others I shall but just make references to. And two histories do remain from the papers of Valsalva. The first of these is as follows.

9. A man of fifty years of age, began to complain of his deglutition being impeded. The impediment was by degrees increas'd: his voice was lost: he had a considerable pain in swallowing: a portion of the food remained in his fauces, which sometimes return'd after that, by degrees, into his mouth, seemingly corrupted: his body became emaciated: nothing preternatural was to be seen externally; only the left internal maxillary gland was perceiv'd to be indurated. He died suddenly suffocated as it were.

The gland just now mention'd, as being indurated, had at the side of it, a matter like the white of an egg. And many tumours were seen in the pharynx, and at the upper part of the larynx, which were of a cancerous nature.

10. A young man, likewise, who died almost in the same manner, after very similar symptoms of disease, discover'd tumours of the same nature, particularly at the upper part of the larynx, and the neighbouring sides.

of the pharynx. But the tumours, in some places, were already ulcerated: and an ulcer had perforated the epiglottis itself.

11. As to what relates to the sudden death of both these persons, you may from hence confirm what I have before said (*q*) Valsalva had told me, I mean that he had twice seen a death of this kind, from a violent disorder of the larynx, at which time he perhaps had these two cases in his eye. The same was also observ'd by me, in a virgin, of whom I took notice in the same place, and perhaps, also, in a very excellent singer, who was troubled with a very manifest ulcer in the fauces, which caus'd a great difficulty in swallowing. But as it was not possible to determine, in the living body, to what parts this ulcer extended itself, nor yet permitted to examine it after death, I therefore did not lay down the thing as certain, and well enquir'd into, especially as ulcers of that kind, sometimes do not reach to those parts you would suppose them to reach, and reach to others that you would not have supposed. And this will be clearly shown, by the case of a man, who was snatch'd away by the same kind of death: which case, although I have partly hinted at it in the *Epistolæ Anatomicæ* (*r*), and partly in a letter which I have before sent to you (*s*), yet I have no where given at large, but purposely defer'd it to the present occasion, as relating to impeded deglutition.

12. There was a man in whom, as he swallow'd, part of what he drank return'd by his nostrils. The bony palate of the man was quite sound; but the palatum molle, together with the uvula, had been consum'd by an ulcer that was not recent, and which, as far as could be distinguish'd by the eye, was already brought to a cicatrix; but where the eye could not reach, it continued even then, as the matter, which was thrown up by spitting, demonstrated. This join'd to a cough, that was sometimes troublesome, and other symptoms of a similar kind, although slight and ambiguous, created a suspicion of an ulcer extending itself downwards. And this suspicion was encreas'd, by the patient dying suddenly, as if suffocated.

Nevertheless, the inferior part of the pharynx, and the larynx which lies within it, and the canal of the aspera arteria, that lies below the larynx, were altogether uninjur'd: although the left lobe of the lungs, at the upper part, which was hard to the touch, was found, when I cut into it, to be exceedingly corrupted, to a very considerable extent. But the ulcer had extended itself to the higher parts of the pharynx, and to the posterior foramina of the nostrils, and there continued. As to the other parts, when the belly was open'd, I found the liver, the intestines in some places, and the internal muscles of the abdomen, livid, as if from foregoing inflammation, and smelling very strongly.

13. Where, and at what time, I dissected this body, you will find in those epistles, to which I just now refer'd (*t*), and in the same place, and also in the twenty-second of these letters to you (*u*), you will see what I hinted in regard to the origin, and causes of that disorder, of the lungs. But for what relates to the causes, and manner, in which deglutition was injur'd, in this man, or in the two dissected by Valsalva, that I have given you the

(*q*) *Epist.* 22. n. 25.

(*r*) *Epist.* 9. n. 9. & 10.

(*s*) *Epist.* 19. n. 50.

(*t*) *N.* 11.

(*u*) *N.* 26.

histories of, they are so evident to any one, not ignorant of the motions of the whole pharynx, and larynx, that are necessary for the performance of deglutition, that there is not the least occasion to explain them. To these belong seventeen observations, in this fourth section of the Sepulchretum, which are in two appendixes, that are subjoin'd to the twentieth observation. And although when I have, frequently, found, as I have already said, the cartilages of the larynx become bony, in old men (x), the epiglottis was never yet found to be bony by me, I do not, however, doubt but it may sometimes, become less flexible, and yielding: which is a circumstance that seems to be more prejudicial to the swallowing of food, than of drink. For the liquors that we drink, when they have reach'd as far as the epiglottis, flow down on one side, and on the other, where there is a kind of sulcus at the sides of the larynx, and slip down to the lower part of the larynx: nor does it then happen that they enter the larynx, unless they either flow back, in too great a quantity, from the sulci, or these sulci, by inflammation, and a tumid state of the parts, are destroy'd, or a kind of convulsion excited, by irritation, or any of the muscles, that, by reason of being affected with a paralysis, is unequal to its office, disturb the easy flowing down of the liquors: the latter of which I have observ'd, in a woman of princely rank, after an attack of the epileptic kind, and the former, in a noble Count, whose very troublesome disorder I have already describ'd to you (y), and which was, in part, similar to a convulsive, but very short, angina.

I would not here have you suppose, that the consideration of the epiglottis is superfluous, when the question is of impeded deglutition, because Targioni (z) lit on the body of a man, in whom, although the epiglottis was entirely deficient, perhaps from having been formerly destroy'd by an ulcer, the power of speaking, and of swallowing, without any difficulty, were not wanting, or at least, in the last acute disorder of which he died. For although the arytænoid muscles, which were in him much thicker, and stronger, than they in general are; might have been able to shut up the glottis so exactly, as by way of an unusual instance in the human body, to supply the office of the epiglottis, as other parts have supplied the office of the uvula, sometimes, and sometimes of the tongue, when originally deficient, or from disease (a), or whether accurate observations, and examinations, might, while he was living, have shown other things; we ought certainly to take care, in consideration of what happens naturally in the greater part of mankind, and not of what happens by way of prodigy in any one, not to run into such absurdities, as to suppose the epiglottis almost useless, as it were, in deglutition.

I am not ignorant, that there are, at this time, celebrated men, to whom it seems that deglutition may be explained so differently, from the manner in which others explain it, that if you are of their opinion, you will not want that explication which I hinted at just now, of the difference there is betwixt fluids, and solids, in passing from the mouth into

(x) Advers. 1. 2. 23.

(y) Epist. 14. n. 37.

(z) Prima Raccolta di osser. med. verso.
il fine.

(a) Ephem. n. c. Dec. 3. A. 9. obs. 212. &
Slevogt. diss. de Gurgul. §. 61. 63.

the fauces. I confess it is not, at present, either a proper place, or time, to consider the whole of their opinion, as the importance of it requires, yet I will, at least, venture to say, that there is in this opinion, more than one thing, which I can by no means admit.

Nor does it escape me, that there is a remark made by Paul Barbette, that is also to be read here in the Sepulchretum (*b*), which by no means agrees with that explication I have given you above. But if there was, at the same time, “an abolition of speech,” there must have been other disorders, besides a rigidity of the epiglottis, “not sufficiently shutting up” the larynx, in the passage of liquors, or “an induration” of it, to which one circumstance Paulus attributes all the symptoms. But what part was affected with disease, besides the epiglottis, in another certain observation, in which I read that the deglutition “both of solids, and fluids,” was impeded, I should perhaps be able to conjecture, if I understood what appearances were found in the body after death. And the following appearance is said to be found; “the epiglottis, by means of a catarrhus spasm, was so drawn up, towards the orifice of the œsophagus, that the orifice of the aspera arteria remained quite open, and neither fluids, nor solids, could be taken down, for fear of suffocation.” But I cannot possibly conceive, how the orifice of the larynx could be quite open, while the epiglottis was drawn up in such a manner, as this orifice should have been, in that case, quite cover’d. And in this manner I should be ready to suppose it was written by the author, and ill-copied, which is easily done by substituting *apertum* instead of *opertum*, only that the patient would then have been under a necessity of thinking how to breathe merely, instead of thinking how to swallow.

14. But, to return to the observation of Paulus given in the Sepulchretum; as to the attempt in the scholium, which is immediately added, to explain that impediment of deglutition, by “a convulsion of the muscoli hyoidæi, because the larynx is then drawn upwards;” the explanation ought to have been more strict, and express, especially as the muscles, which may be signified by that name, are many in number, and some of them perform offices directly opposite to each other. Nor yet is it to be doubted, that not only the os hyoides, and larynx, but even the parts that belong to them, if they are by any means considerably affected, may cause an impediment to deglutition. For you will call to mind, that this had happen’d from the upper appendages of that bone being luxated, as is related by Valsalva (*c*), and, in like manner, from the cartilages of the larynx being luxated, as Boerhaave (*d*) writes, from the observation of Cowper, the thyroid, I suppose, being remov’d from the cricoid; for the book, in which Cowper gives you this case, I have not in my possession; and whether those things which you may read of, in the acts of the Cæsarean academy (*e*), are referable to the same class, you will judge; the method of cure, at least, comes pretty near to that of Valsalva.

But in regard to the convulsion, or paralysis, of the muscles, even of the œsophagus itself, it is to very little purpose to say any thing, since

(*b*) Obf. 6.

(*c*) De aure hum. c. 2. n. 20.

(*d*) Prælect. ad Instit. §. 806.

(*e*) Tom. 6. obf. 50.

examples of the former are very often to be met with, in hysterical patients, and observations of the latter, though more rare indeed, are not wanting, notwithstanding it is a disease, like other paralytic affections, of much longer continuance, and more obstinate, than the first, so that the patients have, for this reason, either been destroy'd by hunger, as you may see in Willis (*f*), Helwich (*g*), and others, or sometimes by means of aliments being thrust down into the stomach, by the help of a chirurgical instrument, have been kept alive, for twelve, or fourteen months, and at other times, even for sixteen years, the latter of which kind of cases the same author, Willis, has in his Pharmaceut. Ration. (in the first part indeed, but in the second section, and in the first chapter, not as it is said in the Sepulchretum (*b*), section the third, chapter the third), and the former, nature at length having overcome the disorder, Job Baisterus, in the year 1682, communicated to Stalpart (*i*), and the same author, being a lively old man, in the year 1744, which is a remarkable instance, communicated it to the Cæsarean academy (*k*). And Rammazini (*l*) saw a paralysis, of a shorter continuance than that indeed, overcome, without the intrusion of this instrument, into the œsophagus, which is a very troublesome operation, as he saved a female patient without the least food, or drink, for threescore and six days, by the means of nourishing glysters, a longer, and more useful, practice of which, I do not remember ever to have read; and this is a kind of remedy, which, as it is always easy, and always innocent, ought never to be neglected by the physicians, in every species of impeded deglutition, and not only in that from a paralysis of the muscles.

Moreover, you will, I suppose, think with me, that the case which you read, related by the celebrated Heister, in a certain dissertation of John Charles Spies (*m*), is to be refer'd to a kind of slight paralysis. This case is of a nobleman, and one who was already old, and had, for a long time, been affected in such a manner, that though he could swallow every thing very well but his last bolus, he could not, however, swallow that, which, for this reason, frequently remained in his fauces, from one meal to another, till it was, at length, push'd down in the following meal, unless it had happen'd to be previously thrown up, by the help of spitting, or some slight cough. And I made no doubt but this circumstance happen'd much in the same manner, as in men pretty far advanc'd in years, all the urine is expell'd from the bladder, one part urging another, till it comes to the last drops, which the weaken'd power of the muscles is, now, not able entirely to expel, as they had been us'd to do at a more flourishing time of life. So likewise, in this man the former bolusses were push'd forwards by the weight of the following ones, till the last being without that assistance, and not being sufficiently help'd on by the muscles of the pharynx, was under a necessity of remaining, where it had been already thrust.

15. But as this, and most of the disorders of which I have hitherto spoken, related to the pharynx, and the parts that lie nearest to it, so others

(*f*) Pharm. rat. p. 1. f. 1. c. 2.

(*g*) Eph. n. c. cent. 1. & 2. obs. 147.

(*b*) Sect. hac 4. in addit. obs. 2. in fin.

(*i*) Cent. post. p. 1. obs. 27.

(*k*) Act. t. 8. obs. 21.

(*l*) Const. epidem. a. 1691. n. 22.

(*m*) De Degl. c. 2. n. 9.

are also to be met with, which relate to the œsophagus itself, and the parts that lie thereabout. As to convulsion, and paralysis, there is no occasion to say any thing more upon these heads. But there are two other disorders, which are, in like manner, contrary to each other, that may be the causes of difficult deglutition, I mean the dryness of the glands of the œsophagus (*n*), and their œdematous turgescentcy (*o*). Besides, the gula is sometimes ulcerated: a remarkable instance of which you have in the Sepulchretum (*p*). And although an ulcer of itself, if it be painful, or at least if it be large, and have prominent lips, one of which kind was seen by Brunnerus (*q*), whom you must turn to on this occasion, impedes the use of deglutition; yet if there be none of these circumstances, and the ulcer itself begins to be inclin'd to a healing state, or is even already in part healed; it may frequently happen, that some consequences of the ulcer may remain, and obstruct deglutition, as a caruncle, callus, narrowness, or, in fine, coalition, which is taken notice of by Franciscus Sylvius (*r*).

And the caruncle at the termination of the gula, seems to have been formerly hinted at by Galen (*s*), when he said "it sometimes happens, that even something fleshy (such as we often see externally) is generated in the stomach, which either entirely obstructs the passage of the aliments, or, at least, hinders it in some measure." And here, in the Sepulchretum (*t*), you certainly see that a caruncle is taken notice of, which arose from an ulcer of the œsophagus, that was heal'd up. And notwithstanding all calli, of the gullet, are not to be accounted for from ulcers, as, for instance, where you read in Cælius (*u*), of the "beginning, and upper part, of the stomach, being callous," nor yet all narrowness, or contraction, as that which is related in this section (*x*), to have happen'd after an ardent fever, unless you will suppose, that, in this case, there were aphthæ, or internal pustules (*y*); yet where an ulcer has preceded, or, in part, yet remains, as in a soldier (*z*), who found great difficulty in swallowing, but not the least pain, we must attribute "the coarctation, and callosity," of the œsophagus, to the erosion, which was found at the same time, being not entirely remov'd, all round. Nor is it to be doubted, but the same cause that brings on contraction, or narrowness, may also produce coalition, under which name, I here understand, with the learned Mauchart (*a*), that coarctation, which leaves no passage at all, or scarcely any. And indeed, the coalition which he saw (*b*), of a callous nature, and scarcely admitting a slender probe, was not without a purulent ichor. Nevertheless, a coalition does sometimes happen, from other causes, also (as that perhaps did in some measure) many of which I shall take notice of below (*c*), and some of them relate to tumours generated in the very coats of the œsophagus, observations of which kind are given us in this

(*n*) Eph. n. c. cent. 1. append. n. 10. obs. 162.

(*o*) Earund. cent. 5. obs. 59. ubi I. M. Hoffman. & Benedict. Sylvatic. citantur.

(*p*) In addit. ad hanc sect. obs. 1.

(*q*) Gland. Duoden. c. 10.

(*r*) Prax. med. l. 1. c. 5.

(*s*) De sympt. caus. l. 3. c. 2.

(*t*) Obs. 21.

(*u*) Morb. chron. l. 3. c. 2.

(*x*) Obs. 14.

(*y*) Vid. act. Hafn. t. 1. obs. 109. & Eph. n. c. dec. 2. a. 9. obs. 45.

(*z*) Commenc. litter. a. 1741. hebdom. 25. n. 1.

(*a*) Diff. de struma œsoph. §. 18. 22.

(*b*) §. 11.

(*c*) N. 16.

fection of the Sepulchretum (*d*), and another, which well deserves reading, is added by the celebrated Widmann (*e*). But that species of coalition, which is brought about by means of a cartilage, merits our attention above all others, three instances of which are produc'd in the Sepulchretum (*f*): and to these, you will particularly add two others, one of which is accurately describ'd by our Vallisneri (*g*), and the other is moreover illustrated in a very learned dissertation, by the celebrated Trillerus (*h*).

There are some very eminent men, to whom, that disorder “seems to arise from the drinking of hot water,” a custom so frequent in this age, which I do not altogether deny. But I wonder, nevertheless, as even the ancients or at least as the Chinese, who are very tenacious of their customs, have made use of hot liquors, for so long a time, and do still use them, that there have not been formerly found, and are not at present found, among them, such as labour under an impeded, or injur'd, deglutition; and it is even not often, or rather it is so very seldom, that the œsophagus is found to be cartilaginous amongst us, that I do not remember who has ever met with this appearance, in Italy, besides Vallisneri, and even he found it in such a man, in such a place, and at such a time, that it does not seem possible to account for it, from the abuse of coffee, or tea: and I do not mention that Trillerus, in his case, had accounted for it from quite an opposite cause (*i*).

Be this as it will, I mention'd coalition by means of a cartilage, because here also I observe the œsophagus, if not to be entirely stop'd up by a cartilage, as in the observation of Stofelius (*k*), at least to be so far obstructed in the other instances, that only a very small foramen remain'd. But what if the cartilage did not protuberate outwards; but left the passage open to its natural size? do you think that the faculty of deglutition would be unhurt? that very experienc'd physician, Victorius Gornia, communicated to me a dissection made in Germany, of the body of a most high, and mighty prince, whose œsophagus was externally membranous, but internally cartilaginous, and towards the stomach bony, to the extent of an inch. Yet this prince had not only, for the last two years of his life, vomited every day at the interval of two hours after dinner; but had even never complain'd of any uneasiness, or difficulty, in swallowing. Does it not follow then, that the food, also, may be driven on by the stronger muscles of the pharynx, through the gula, when not collaps'd in its parietes, nor standing in need of dilatation, but perpetually kept open by the rigidity of its sides, in the very same manner as the blood is propell'd through a bony artery, by the force of the heart, and the arteries which lie behind it?

You, therefore, will consider of this, and at the same time adding the last observation, to the five I mention'd above, you will again consider with yourself, whether it seems proper, to attribute to the abuse of hot water, that disorder, which, as is demonstrat'd by four out of these six examples, did not occupy the tongue, the fauces, or the upper tract of the gullet, but chiefly the lower part of this tube. And of the other two, one describes the disorder, as be-

(*d*) Obs. 22. §. 1. & in addit. obs. 2.

(*e*) Act. n. c. t. 6. obs. 149.

(*f*) Obs. 8. g. 20.

(*g*) Opere, t. 3. observ. 36.

(*h*) De fame lethali ex callosa oris ventric. angustia.

(*i*) Ibid. §. 42.

(*k*) 20. hic in Sepulch.

ginning from the region of the clavicles; so that there is one, in which the beginning of the œsophagus is said to be shut up by a cartilage, together with the termination of the pharynx: and for this reason Stoffelius enquir'd, which others would not even have thought of, whether we might not make use of pharyngotomy, in imitation of the operation that they call laryngotomy, or rather, whether an incision might not be made into the upper part of the œsophagus, through which a pipe, carrying in nourishment, might be convey'd, by preferring an uncertain remedy, as he says, to a certain death; but at the same time, which is to be lamented, a very difficult and dangerous operation, as all must readily conceive, who compare the deep situation of the upper part of the œsophagus, with that of the *aspera arteria*, which lies quite at hand, and is almost superficial, especially as it is attended with so many muscles, nerves, and considerable vessels.

16. And that the parts, lying near to the œsophagus, may impede deglutition, in more ways than one, is shown even by those observations, which, as I have written them to you in other places, it will be sufficient here to point out, in pursuance of my promise. For these parts can not only be injurious, by making such a compression as to obstruct the passage, in the manner of that tumefied gland, in a woman of eighty years of age (*l*), or of the great artery, when dilated in the trumpeter (*m*), or as even both of them together, in a man dissected by Valsalva, when he was a young man (*n*); but also by deterring the patient from swallowing, since even when the passage is open, these parts, being compress'd by the aliments that are swallow'd, bring on danger of suffocation, as the dilated aorta did, in the woman who was dissected by the same person (*o*), in the marquis Paulucci (*p*) and in Ferrarini physician at the court of Modena (*q*). But to return to the glands that compress the œsophagus, what the thymus, when tumefied, can do to produce this effect, is not only shown in this section of the Sepulchretum (*r*), but also confirm'd by the observation of Verdriesius (*s*). And there are other glands, which, by their distention, pressing immediately upon the gullet, without any thing being interpos'd, do, in like manner, produce narrowness, and coalition, and in particular those that are call'd *glandulæ dorsales*: and this you will learn from the same section (*t*), and still more from some observations of a great number of dissectors, which are pointed out by me, in the *Epistolæ Anatomicæ* (*u*), and which you may join to the Sepulchretum, careless of the hesitation of Mauchart (*x*), when he wonder'd that those, at least, which are taken from Laurentius, and Diemerbroeck, for the others he readily admitted of, were not to be found in his copies of those authors works, because he would not have wonder'd, had he observ'd, that as Laurentius, and Diemerbroeck, had both of them revis'd their writings, the first since the year 1595, and the last since the year 1679, and had made additions to them at the same time, it was proper for me, not to make

(*l*) *Epist.* 15. n. 15.

(*m*) *Epist.* 18. n. 22.

(*n*) *Epist.* 17. n. 19.

(*o*) *Ibid.* n. 25.

(*p*) *Ibid.* n. 26.

(*q*) *Epist.* 18. n. 17.

(*r*) *Obf.* 10.

(*s*) *Eph.* n. c. cent. 8. *obf.* 90.

(*t*) *Obf.* 16.

(*u*) *Epist.* 9. n. 46.

(*x*) *Dissert.* *supra* ad. n. 15. cit. §. 6.

use of those former, but of the latter, editions, in which, if you enquire, those very words are to be found, that I have quoted from each.

Mauchart however, as he is a man no less cautious, than humane, on such an occasion, has at least said, that which cannot be denied, I mean, that the words are not to be found in his copies of these authors. But another gentleman who is, in other respects, very learned, having in his disputation on the fistula lachrymalis, happen'd to light, among other things that he took from me, on a passage of Aristotle, from the second book *De generatione animalium* C. V. which was quoted by me, *en passant*, in the sixth of the *Adversaria* (y), and having copied the words, as they are given by me, has pretty confidently pronounc'd, "that these words were not really to be found, in the "place quoted," not once calling to mind, that some might, perhaps, make use of copies, which were differently divided from his. And as with Sylvester Maurus, I follow'd not only "the common division, of the works "of Aristotle, into books, and chapters, but also the common translation," or rather, the very words of Aristotle himself, I hop'd, indeed, that if any should choose to collate the passage with the original, from whence it was taken, they would look for it according to the common division, or, if they happen'd to be without this, that they would readily find the passage, in their editions of that second book, in which the questions of the proofs of fecundity are treated of, and in that passage would find the same words, or at least, the same sentence.

And I say the sentence, lest you should, perhaps, be put to a stand by that one word *colorent*; for that Aristotle meant this, is not only demonstrated by reason, but affirmed by physicians, and amongst them by Niphus (z), who had explain'd the same book, and passage, of Aristotle, a hundred and twenty years before the paraphrase of Maurus (a).

And indeed, when I examined the word *χρωματίζωσι*, which Aristotle has made use of, in the Greek text, as it was proper I should, and which certainly signifies *colorent*, *tingant*, *insuficient*, that is "colour, stain, or dye;" I made not the least doubt, but it ought to be thus render'd, and consequently, suppos'd it to be owing to an error of the copists, or printers, that in the translation *perficient* is foolishly inserted, in the place of *insuficient*. And this remark, I was willing to throw in, on this occasion, lest those who read hesitations, or censures, of this kind in dissertations that have been much commended, and have gone through more than one impression, should suppose, in consequence of my perpetual silence, and still more from the authority of those by whom both these dissertations were written, that these strictures are just.

For as to a somebody, whose name I would not so much as enquire into, but only into this one thing, whether he could say, which has been denied, that he had receiv'd any provocation from me; as to somebody, I say, whether more fool, or knave, I know not, having, as I was told in former years, babbled out something rashly, and injuriously, in opposition to the opinion of the greatest men, and the most proper judges, in regard to my method of writing, formerly, upon some books, which was ne-

(y) Animad. 65.

(z) Expof. in l. 2. Aristot. de generat. animal.

(a) Ejusdem l. 2. c. 5. art. 3. ad. n. 11.

cessary, and useful; I shall never be so weak as to suppose, that wise men expect me to make any reply: I will therefore leave him, and such as he, if there are any such besides, to their own dreams, with the ridiculous interpretations of which I hear he is delighted. But if men who deserve answers, object any thing to me, with humanity, and good nature (and I wish there were not many things to be objected) I shall always be ready to give them every satisfaction in my power, and if by no other means, at least by the modesty of my reply.

But now, returning to our subject; besides the dorsal glands, from the turgescency of which Mauchart (*b*) mentions, that Mangetus had also seen a coalition of the gula, there are others, I say, which do not always occur to anatomists; although the dorsal glands do not always occur; that are more morbid, or at least more frequently so, which may produce the same effect, as those that were seen by the same author Mauchart (*c*), near to the termination of the œsophagus, and at the termination itself, would certainly have done, if their swelling had been more increas'd, as those were, which Vallisneri (*d*) found, together with that change into cartilage. And thus the same thing happen'd in the very termination of the œsophagus, from a tumour that was either schirrhous, or made up of hard fat, the observations of Bonetus (*e*) in preference to others, and of a surgeon commended by Mauchart (*f*), demonstrate. But there is another part besides these, which exists in all bodies, and which, by immoderately constringing the lower part of the gula, produces an impediment to deglutition. This part is the diaphragm, betwixt the muscular flesh of which, the lower part of the œsophagus passes. Wherefore you see, why in that servant-man, whose diaphragm the celebrated Heister (*g*) saw "very much inflam'd," there was an incapacity of swallowing," and why some hysterical women perceive, in the place just pointed out, an obstacle oppos'd to deglutition, as in that woman (*h*), in whom I accounted for it, from those very muscular parts of the diaphragm being convuls'd, betwixt which there is a foramen, or fissure, to transmit the œsophagus; for that woman, when she had, already, got her food down almost to the stomach, perceiv'd an obstacle in that place. It gave me no small displeasure, that when I had found this foramen to be much shorter than usual, in some bodies, as in a certain old man who had been a porter (*i*), and in another old man, of whom I shall write hereafter (*k*), had met with it, as well as the œsophagus itself, which was in that part much wider, and more red, than usual, very large, especially in its breadth, I was much pleas'd, I say, that I could get no certain information in regard to either, whether they had perceiv'd any uneasiness, or difficulty, in swallowing, at that part.

17. And besides those that I have hitherto spoken of, I have also observ'd, that there is another part, which may compress the œsophagus, and that at the lower part. I mean the liver. For as there is an excavation, or

(*b*) Diff. cit. §. 12.

(*c*) §. 11.

(*d*) Obs. supra cit. ad n. 15.

(*e*) Sect. hac Sepulchr. obs. 22. §. 2.

(*f*) Diff. cit. §. 9.

(*g*) Dissert. sist. obs. med. miscell. obs. 15.

(*h*) Epist. 23. n. 4. & seq.

(*i*) Epist. 10. n. 19.

(*k*) Epist. 37. n. 30.

hollowing, in the posterior margin of this viscus taken notice of by the celebrated Winflow (*l*), which gives way both to the protuberance of the spine, and to the lower part of the œsophagus, when about to expand itself into the stomach; it can be easily conceiv'd, that if the liver should, at any time, become much swell'd, particularly in this part, and hard, it may press the œsophagus close upon the spine. And, indeed, I see that in this section of the Sepulchretum (*m*), the liver is taken notice of, among the causes of impeded deglutition, but not as being injurious in this manner, although Ballonius (*n*) seems to come somewhat nearer thereto. There is a far different method, which is a just one indeed, but in part, by which the celebrated Fantonus teaches (*o*), why, the stomach being thrust down into the umbilical region, by the vast bulk and weight of the liver, and its superior orifice being compress'd, aliments, and especially fluid ones, were swallow'd with difficulty. For he says, "that the cavity of the œsophagus " being thus elongated, by the force that was put upon it, had become much " narrower than usual," and that the stomach itself, being streighten'd by the compression, had resisted the food which was about to enter into it. And I think that the former part of this kind of explication, might be added to the others, in order to render it more easily intelligible, in the first observation of this section, why a soldier " being seiz'd with an opisthotonos, could " swallow nothing." For the neck being bent backwards, the œsophagus is distended, and thus as it becomes longer, so much in proportion is it made narrower, the anterior paries thereof approaching nearer to the posterior. And the same kind of explication may, in some measure, take place, where Hippocrates (*p*) speaks of " a distortion of the neck" coming on, so that the patient " could scarcely swallow."

18. It does not, however, escape me, that other causes of injur'd deglutition may be produc'd, some of which you will even find in the Sepulchretum. Yet you will not easily be persuaded, to enumerate among these as certain, that which is promis'd in the thirteenth observation, by having this title prefix'd to it, " A difficulty of deglutition on account of the œsophagus " being divided." For Blasius describes this tube to have been so divided, within the thorax of that boy, as to return into one cavity again, a little below its division, or as anatomists speak at present to have become insulated, or have made an island. But of any difficulty of deglutition, he does not throw in the least hint; so that this conformation seems to have been more unusual, than injurious. But we ought to form quite a different judgment, of that which the excellent John Graafhuis (*q*) found, I mean a morbid dilatation of the œsophagus, about the middle of the thorax, into a lateral sac, upon which, symptoms of deglutition, that were every now and then varying, depended, and symptoms that could never have been explain'd, without dissection. You may very soon expect another letter, which will, perhaps, be somewhat longer: but in the mean while, farewell.

(*l*) Expof. anat. tr. du bas ventre n. 259.

(*m*) Obf. 26. §. 2.

(*n*) In schol. ad. obf. 25.

(*o*) In schol. ad patris obf. anat. med. 24.

(*p*) Sect. 4. aphor. 35.

(*q*) Aët. n. c. t. 6. obf. 73.

LETTER the TWENTY-NINTH,

Contains a few flight Observations upon the Singultus or Hiccup, and upon Rumination or chewing the Cud, in Men. The other Part relates to Pain in the Stomach.

1. **A**LTHOUGH you will find three sections, in the Sepulchretum, upon the next disorders of the stomach, “the Singultus, injur’d concoction, and pain,” one upon each, yet I would not have you expect as many letters from me. For the two first, when they are violent, are of such a kind, that the one is found to be join’d with fevers, inflammations, wounds, and other diseases of the like kind, and the other with more considerable disorders, which it is either the consequence of, or has itself produc’d, so that they will be treated of, in conjunction with these disorders, as I am unwilling to repeat the same histories. And this you will be able to understand, very clearly, immediately upon turning to those two sections, which are written upon these subjects. For in the sixth, which is upon injur’d concoction, you will see it expressly declar’d to what diseases most of the observations more peculiarly relate, and in what places they have been produc’d more at large. And in regard to the remaining observations, all those that are written with any degree of accuracy, of themselves sufficiently show, whether they ought to be refer’d to any other section. For there are some, in which you will not find a single word, upon the subject of injur’d concoction, as that which you have under number eight, article the second, and that under number one, in the Additamenta. And why any observation, like that which follows next, which refers to those persons who “were able to concoct, not to say retain, their food, and had an appetite “for it, almost to the latter part of their lives,” should be inserted there, does not at all appear.

2. And what observation is there of the whole fifth section, from which you are not refer’d to another section? Or if you are not openly refer’d, do you not think that you might be with propriety, not to say that you ought? And yet, even with all this sarrago of repetition, the whole number of the observations, when collected together, is but small; notwithstanding one of them (a) seems to be set down more than once. For which reason, I should suppose four appendices were thrown in, that the whole section might not seem to be immoderately short; in none of which appendices, any body is

(a) Confer. obs. 6. cum §. 6. obs. 7.

mention'd to have been inspect'd; and that, for the same reason, two dissections were added of ruminating men, which I should less wonder at, if they had been given where the question is of vomiting: nor is that sufficient; for last of all, a discourse on rumination, or chewing the cud, is added from Peyerus, which is so long as to exceed the length of the whole section. But do not imagine, however, that these things are taken notice of by me, as if I entirely disapprov'd them; but call to mind my intention. And even attend to these few things, which naturally arose in my mind, when I read over those appendices upon the Singultus, and the observations of men who chew'd the cud, some from one occasion and some from another, as is generally the case.

3. In the second appendix, when Thomas Bartholin mentions among the causes of Singultus, a tumour that compress'd the nerves going to the stomach, and says "it was suspected that there was a tumour of this kind, " in that man, whom I knew at Padua, and who was troubled with a perpetual uneasiness from the hiccup;" the observation of Jo. Rhodius (*b*) came into my mind, which relates to the same case, and which, although it is somewhat obscure, may nevertheless be look'd into by you. The same Bartholin asks, in the third appendix, "why just opening a vein in the "arm" should be of advantage in a certain Singultus, which he describes, and which is really extraordinary? What? if the superior phrenic vein, which you know accompanies the phrenic nerve, upon the quantity of blood, which was about to return, to that part where it would flow into that vein, being diminish'd, having been, consequently, reliev'd of a part of its load, either press'd less upon its attendant nerve, or absorb'd something, from whence this nerve was irritated? And as in all these appendices, mention is made of remedies against the Singultus, nor even externals remain unnoticed in the first, and the second; it brings to my mind the success of an easy, and obvious, remedy of Valsalva's, in a noble Count, that is milk, with which he fomented the abdomen; for as long as the cloths were wet with the milk, so long was the Singultus, which was so troublesome to the patient, restrain'd: in which, however, theriaca, when laid upon the part, was not without its use.

But as to the remark, which is made in a kind of scholium (*c*), that is plac'd betwixt the third, and the fourth appendix, of a Singultus, which, although it came on in a certain fever, that was attended with the worst of symptoms, was not mortal, it is a very rare instance indeed, and the contrary is asserted by two very eminent physicians; among the rest, Franciscus Vallesius (*d*), and Hieronymus Mercurialis (*e*), who deny that it ever happen'd to them to be witnesses of a favourable event in a case of the kind, nor did it happen otherwise to Hippocrates, in that woman who lay ill in the *forum mendacum*.

And in the malignant fevers, in like manner, describ'd by our Rammazzini (*f*), as many as ever were troubled with a Singultus, all perish'd, and one of

(*b*) Cent. 2. obs. med. 61.

(*c*) Ad §. 6. obs. 7.

(*d*) Comment. in Hippocr. epidem. 1. 3. f. 2.

ægr. 12.

(*e*) Prælect. pisan. in eand. hist. quæ ibi 26.

(*f*) Constit. a. 1692 & duor. seq. n. 22.

them being dissected, the stomach was found "to be mark'd here and there "with black spots:" and what was found, in the stomach of a certain man, who had been affected with the hiccup, you will learn from the *Opuscula Pathologica* of the celebrated Haller (*g*). Ledelius, however (*b*), after having quoted Epiphanius Ferdinandus, as "calling God to witness, that he had "never been deceiv'd in predicting death in ardent, and malignant fevers, "which were attended with a Singultus," prudently admonishes us, "that "a patient ought not to be deserted, as long as there is life, because prodigies many times happen, in the cure of diseases," as happen'd to him in a certain baker. And not to him alone, but to others also, as to Lanzonus (*i*), the celebrated Delius (*k*), and to me, in that epidemical constitution at Forli, in the year 1711, which I have already described to you (*l*). For the two patients, whom I mention'd, in the first place, in that description, were still alive when I wrote these things; although whoever had then seen them, and particularly Garavini, who was more like a dead person, than a living one, for some days together, and had heard, besides, the frequent Singultus of each, would have immediately given up all hope of their recovery.

4. But as to men who chew the cud, examples of which Peyerus has collected, in the greatest number he was able (*m*), and has refer'd some to rumination which was in-bred, and congenial, as it were, and others to that which is the consequence of disease; the same person has imagin'd that two observations, of a nobleman, and of a monk, both of which you see here in the Sepulchretum (*n*), relate to these two kinds, one to each. Both of them were made at Padua, and are the first of them all, and the only observations, besides, which are join'd with dissection; one thing is very foolishly added here, "that this monk had two horns." For Rhodius (*o*) does not say it, in which Peyerus blunders (*p*), though he otherwise justly blames Bartholin, who has added it (*q*), and those who have follow'd Bartholin.

Certainly, Fabricius ab Aquapendente (*r*), as he took notice of this same monk, would by no means have omitted that circumstance, inasmuch as he had, a little before, thought it quite necessary to add, "that the father of "this ruminating gentleman, had born a little horn on his head. And "among others, who copied that blunder of Bartholin, was Etmuller (*s*), "who added one of his own, over and above; I mean that in these ruminating men, the stomach had been observ'd to be much more fibrous, "and fleshy, than usual, as if it had been cover'd with a muscular coat." I wish we could so defend him, as to suppose, that by the term *stomachus* he meant the oesophagus; for this part Plazzonus (*t*), really, found "everywhere fleshy, like a muscle" that is, not only such, as "all men evidently have," as Tryerius would have it suppos'd (*u*); for unless it had been

(*g*) Obf. 14.

(*b*) Eph. n. c. Dec. 3. A. 7. obf. 127.

(*i*) Earund. cent. 1. obf. 61.

(*k*) Ex. act. T. 8. obf. 108.

(*l*) Epist. 7. n. 16.

(*m*) Merycol. l. 1. c. 6. & l. 3. c. 3.

(*n*) Obf. 10. & 9.

(*o*) Cent. 2. obf. 59.

(*p*) C. 6. cit.

(*q*) Cent. 5. hist. anat. 61.

(*r*) De ventric. intest. &c. ubi de vari. ventric. in fin.

(*s*) Prax. l. 1. f. 4. c. 1.

(*t*) Vid. Rhod. obf. cit. 59 quæ 9. in Sepulchr.

(*u*) C. 6. cit.

much more fleshy, an anatomist, of some eminence, would not have observ'd this one thing only, at the same time that he pronounc'd "all the other" parts of the body, to be in their proper state." But for Etmüller; if however he did write these things; we cannot make use of this defence, inasmuch as he; which all the things that he had said before, in that chapter, show; by the term *stomachus* always meant *ventriculus* or stomach.

Yet that blunder of Bartholin is still more considerable, where he left these words, in his *Anatome quantum renovata* (x): "and indeed we cannot doubt but the stomach was double, in a ruminating man, spoken of by Salmuthus and others." And I wonder that this should have been transfer'd into the Sepulchretum, in that Scholium, which is subjoin'd to the two observations, that teach the contrary, of which I have hitherto spoken, especially as Bartholin could produce no dissection, besides these, of a man who chew'd the cud, not even from Salmuthus, and as, moreover, hares, and rabbits chew the cud, and nevertheless have not two stomachs.

5. However, although it never happen'd to Valsalva, nor to me, to see men who chew'd the cud, and much less to dissect their bodies; yet it has happen'd frequently to us, to dissect the bodies of men, who had been troubled with a violent pain in the stomach, of which the seventh section, as I have said above, professedly treats. And the observations of this kind, which I suppose to agree better with the purpose of this letter, than those of others, I shall immediately purpose. And first I shall give you three from Valsalva.

6. A man of sixty years of age, of a bilious constitution, had begun, for many years, to complain of a weakness, and pain, in the stomach, when at length a hardness, about that region, came on, below which, some hard globules besides (but these were very moveable) were perceiv'd, and attended with some tension of the whole belly. The belly, when shaken, evidently show'd that a kind of humour was extravasated within it. There were frequent borgorigmi of the intestines, and eructations of flatus. Vomiting return'd, more than once, at the distance of some hours after eating; which, however, had happen'd but seldom in the first years of the disease.

In the mean while, the patient made but little urine, was very thirsty, and complain'd of a dryness of the tongue: his pulse was weak, and small. At length, though a great quantity of serum was discharg'd, by the urinary passages, and the swelling of the belly was diminish'd, yet the other disagreeable symptoms, nevertheless, becoming every day more and more severe, and the vomitings being in the last month of his life, of a kind of serum ting'd, as it were, with foot, and smelling very strong, so that the patient, himself, said it resembled the bad smell of putrid flesh; his strength was gradually diminish'd, his speech became stammering, and he died.

The abdomen, even then, contained a pint, or two, of serum, similar to water, in which fresh meat has been wash'd. The whole omentum was contracted into certain tuberosities of different colours, which were mov'd, as that was mov'd. The stomach overflow'd with serum, of the same kind with that, which was thrown up by vomiting: but it was become quite hard, in about a third part of it: this part lay towards the pylorus, and had so

streighten'd it, that the aliments had scarcely room to pass through, after being prepar'd in the stomach. But although the whole of this hard part, when cut into, shew'd a white and solid substance internally, of which it consisted; yet on that surface, which was turn'd towards the cavity of the stomach, it entirely resembled both in colour, and smell, putrid flesh, distinguished with certain bloody points.

7. You see that those hard, and moveable, globules below the region of the stomach, were the tuberosities into which the omentum had contracted itself: and that the upper hardness was a schirrhus of the stomach, which as long as it did not extend itself by its encrease, so as to compress the pylorus, and straighten the passage through it, did not cause the vomitings to happen so frequently. The pain also, in the beginning of the disease, was but slight, as it arose only from some weight of the schirrhus, and from the resistance of the coats, which it occupied, to the proper extension of the stomach being made, for the reception of the food, or if this distention was brought on, from that part of the coats which was still sound, being incapable, of themselves, to bear all the distention that was necessary, without uneasiness. But when the schirrhus was encreas'd, and degenerated, at length, into a cancer, and that ulcerated; the pains must, of course, more and more encrease. For the stomach being thus affected, concoction being vitiated, and the balmy nature of the blood depriv'd, it is not at all to be wonder'd at, that the other circumstances of the history, should also happen, especially as that hardness of the stomach, and the tuberosities into which the omentum, that is connected to the stomach, had contracted itself, made a resistance to the free course of the humours. And from these considerations we may very well conceive how flatus, vomiting, ascites, weakness, and death, were the consequences of the original disease.

8. A woman of forty years of age, of a fleshy habit, but a fallow colour, having eaten onions, preserv'd in salt, and vinegar, together with bread made from the meal of chefnuts, began immediately to complain of a pain in her stomach. Which growing more and more violent, at the end of three hours, after eating this meal, she died in cold sweats, and a fatal syncope, which had seiz'd her.

Her belly being open'd, on account of a suspicion that she had been poison'd, every thing was found to be in its natural state, except that the stomach was distended to a very great degree, and somewhat inflam'd; but the blood preserv'd nearly its natural fluidity.

9. Valsalva thought proper to make this conjecture, in regard to the cause of the disease, that an effervescence being excited by the incongruity of that kind of food, this very great distention of the stomach had been, consequently, brought on, which, by compressing the sanguiferous vessels thereof, caus'd a remora to the blood's motion, from whence inflammation arose, and from this, an irritation of the nerves of the stomach, from whence, again, a syncope.

But however, this history may confirm what Diphilus, and Mnesithæus, say in Ludovicus Nonnius (y), of chefnuts, and the experience they had had

of their power of causing flatus; yet the same author does not deny, that they are in very common use, among many of the people inhabiting the Alps, and it is commonly known, that a bread is even made from their meal, which those people feed on in common, where, as Avantius (z) also asserts, “a great quantity of them grows.” Must we therefore, accuse the onion, which was added to that kind of bread, and suppose it, by means of its acrimony, to have attenuated, and cut, the gross particles of the chefnuts, and so let loose too great a quantity of air? As if, truly, the same rustic inhabitants of the Alps did not eat onions, occasionally, with their bread. This woman, however, seems to have had a stomach somewhat weak, and unaccustom’d to such a kind of food; and those rustics seem to have, as Horace (a) says,

*Dura messorum ilia;
The reapers brawny sides.*

But I believe that these circumstances were much better known to those who knew the woman, than to us. Whence then could the suspicion of poison arise, as they were not unacquainted with all these things? For if the woman had cramm’d herself, with an immoderate quantity of this food, there is no doubt but they would have known it, and have had less reason to suspect poison. You see, in this very seventh section of the Sepulchretum (b), that a little boy, in like manner, “died within the space of three hours,” from the immoderate eating of grapes. Yet there appear’d, at the same time, another reason, why this child died in that manner. “For the stomach being perforated, contained a great quantity of green ichor, which, without doubt,” says Rhodius, the writer of the observation, “was an æruginous bile,” that was endow’d with a very great acrimony.

How then was the case? I should be entirely of opinion, that in this woman, also, there was some other peculiar circumstance lying hid, although it did not fall under the notice of the eyes, in dissection, so that by this she was already dispos’d, if any cause did but happen to be added, as that flatulent and unusual kind of food, she was, I say, so dispos’d, as to be affected in this manner therefrom, though so many others are not us’d to be at all affected by the same diet, whether this disposing circumstance lay hid in those juices, which the food met with in the stomach, or in the nerves, which were endow’d with a more exquisite sense, and consequently more prone to irritation, and more ready to transfer that irritation to any other part, that is to the heart, in particular, to which the same nerves go, that go to the stomach.

In this manner therefore, or nearly so, you will understand what Valsalva conjectur’d: although we have scarcely any proof of the bad habit of this woman, from the fallow colour of her skin. Without doubt, in two other women, both of whom had eaten a melon, the one “stew’d in an oven with onions, and pepper,” after which she drank cold water, and the other, “boiled in milk, and well-season’d with pepper,” after which she drank cold, and four small beer, and who were both taken off soon after by a sudden death; in these

(z) Not. ad. Fieræ coenam, ubi de pane non frumentac.

(a) Epod. 3.

(b) Obs. 7.

women I say, without doubt, a bad disposition of body was more evident, as in one of them there had been a suppression of the menses, for the space of three months, and in the other, besides an advanc'd age, of seventy years, a long weakness of the stomach, and a decrease of strength. Yet there is also no doubt, but Christophorus Seligerus (c), and Michael Ernestus Ettmüller (d), observ'd more cachectic appearances in the body of one before dissection, and more morbid appearances in the stomach of both, or at least of one, by means of dissection.

10. A nobleman of Bologna, who was aged more than sixty, by one year, having been already troubled, for many years, at one time, with a hemi-crania, and at another time, with a gout, which was frequently vague, and wandering, and sometimes also fix'd, and at other times with calculi of the kidneys, was, last of all, seiz'd with a gout in the right hand, without any tumour, but with a mild pain, which, as the power of feeling was soon become less quick, and strong, could scarcely be perceiv'd. His hand became entirely well; but in the mean while the right kidney was painful. But here also the pain was alleviated, fruitless reachings to vomit often recurring: however, when the vomiting ceas'd the gout seiz'd, in the same manner, upon his lower limb, and gave the patient excruciating pain at his calf, and at the ankle joint. After one or two days having pass'd, that whole extremity of the foot was entirely depriv'd of the powers of feeling, and moving. Yet the day following, some sense of pain return'd to the paralytic foot, and to the patient, both good spirits, and good pulse, which, at other times, was, for the most part, intermitting, and unequal, in the right arm.

At length, the day before he died, he threw up his food, mix'd with a watry matter: and felt a slight pain, with pulsation, and heat, at the region of the stomach. A little after that he vomited twice a yellow humour. On the following night he slept but little. In the morning, he complained with a very low voice, of three things, which had been continually troublesome to him, a great thirst, a bad taste in his mouth, and lost appetite: and the fever, which had before discover'd itself, in the pulse only, and that at times, was now evident. But the pain, and pulsation, of the stomach continuing, with a great heat in the back, the pulse, which had been very languid, the evening before, was now, from a great discharge of blood, by stool, totally abolished.

With this blood was mix'd a matter, that smelt very strong, and which, like melted pitch, follow'd the stick that was put into it, if you drew it back. In the mean while, the foot was very much in pain; and there was a sensation of something ascending, as it were, through the leg, and afterwards a sense of weight, in the lower part of the belly. But in the right arm, the power of motion was gradually lost, the nails of the fingers becoming livid: and that arm was soon after render'd quite paralytic. Some hours before death, frequent tremors were perceiv'd, about the præcordia. The discharge of blood returning by stool, as before, and the vomiting of the same kind of matter, perhaps, being at hand (as a nausea, and ill smell, like that of fæces, proceeding from the mouth, seem'd to show) the

(c) Eph. n. c. dec. 2. a. 1. obs. 139.

(d) Earund. cent. 9. obs. 66.

patient, saying he was suffocated, died about six and thirty hours after being attacked with the pain of his stomach.

The abdomen being open'd, the whole substance of the intestines was found to be occupied with a dreadful inflammation, from the stomach, quite to the termination of the rectum, so that not the least part of them was left unaffected with it. And in the intestines, a bloody matter, like that which had been discharg'd, was contain'd. The stomach and the kidneys were found. In the thorax, the posterior parts of the lungs, and particularly on the left side, were slightly inflam'd. In the pericardium, was a small quantity of water. In the heart were no polypous concretions.

11. The aphorism of Hippocrates (*e*), "If any person that is weaken'd, and emaciated, by an acute, or long continued disorder, or even by a wound, or from any other cause whatever, discharge *atra bilis* or black blood, as it were, by stool, he dies on the day following," except that it seems to have been fulfill'd in a somewhat shorter space of time, squares still better with this case, than with that to which it is applied by Ballonius, as you see here in the Sepulchretum (*f*). For his patient, who was, in the same manner, troubled with pains, at the region of his stomach, did indeed, "discharge an atrabilious blood," the day before he died, but it was "by the mouth." However Ballonius did not describe any disorder in the stomach itself, and Vallalva has represented it as being found. Both of them discover'd such appearances, near the stomach, that might easily account for the affection of that part. And the pulsation which was remark'd by Vallalva, was without doubt the effect of the blood, which was collected in the nearest parietes of the intestines, and the cause of its discharge into their cavity. For the vessels, by having their coats still more and more distended, were at length ruptur'd, and had their contents evacuated. To which, perhaps, a part of that prediction, to return to Hippocrates, may be applied (*g*): "palpitations about the belly shew an eruption of blood to be at hand."

But be that as it will, this one thing is certain, that almost all the force of so long, and so various, a disease, had, at length, suddenly fallen upon the vessels of the intestines, and had drawn the stomach, which is conjoin'd by vessels, with the intestines, and even by the very substance itself, into consent with them. So you will see it was drawn into consent, in another person, who, through the whole course of the disease, had discharg'd a black matter by stool, and in another, also, in whom the upper part of the intestines had grown livid. These two histories, you have in the fifth section preceding (*b*), which relates to the Singultus. And, without doubt, you would have a third also, in this (*i*), where all the intestines are describ'd as being extremely red, from inflammation, if the disease were also describ'd, as the dissection is, without which I wonder how this, and perhaps others, came to be plac'd among those that relate to the pain of the stomach.

And certainly, in the volumes of the Cæsarean Academy (*k*), you will find more than one observation, wherein not only the stomach was affected,

(*e*) 23. §. 4.

(*f*) Obs. 19.

(*g*) Prædict. l. 1. n. 29.

(*b*) Obs. 1. & 6.

(*i*) Obs. 50.

(*k*) Dec. 3. a. 9. obs. 222. & act. t. 2. obs. 103. 2. loco.

while the patient was living, but also an inflammation, or bad state, in some measure, of the intestines, and not of the stomach, was found after death. But if, in regard to that observation, which I just now copied from Valsalva, you rather ask, why the intestines themselves, as they were so very much affected, were not, consequently, excruciated with the pain, by which the contenting stomach was attacked; I believe I shall not be very far short of truth, if I suppose that, as in this man so many nerves speedily, and frequently, became paralytic, the nerves which went to the intestines, also, were resolv'd. But now I will likewise add some of my own observations, as I have promis'd.

12. A woman of forty years of age, who had been us'd, for the most part, to eat salt victuals, and drink generous wine, had been for many years subject to pains of the stomach, of which, a loss of appetite for food, and a nausea, were the consequences, and these were soon after follow'd by repeated vomitings of blood, with a continual fever, watchings, and thirst. And although the belly, when examin'd with the hand, never discover'd any remarkable hardness, in any part of it; yet the region of the stomach was not quite free, at times, from an uneasy sensation when scarcely any pressure was applied, and this even when the more violent pain was absent. She complain'd also of her loins; but this was only, either when she was about some greater labour than usual, or when she lifted any considerable weight.

A very obstinate pain of the head was, moreover, sometimes added, to the other complaints. Against all these disorders of the stomach that I have mention'd, as often as ever they recur'd with any great violence, blood-letting was always of some advantage: drinking plentifully of water also, in which a piece of bread, only, had been boil'd, was likewise of great use: and she seem'd, more than once, to have been quite recover'd, by the long use of milk-diet, and receiv'd fresh spirits every month, by the discharge of blood from the uterus, which continued regularly to the time of her death. In this manner it was that death came on.

Not long before, a hard tumour appear'd on each side, above the clavicles, where the external jugular vein goes down on the neck; this tumour created pain, nor would yield to any remedies, so that it encreas'd every day, and already caus'd respiration to be carried on with some difficulty. To this was added a continual fever, increasing in the evening, with which a little rigor was, sometimes, observ'd. She complain'd that her head was in pain, besides her stomach, where the pain was continual: with which, however, there never was, at this time, any vomiting of blood. She had, continually, a troublesome thirst, and a sense of very great bitterness in the mouth, from which, in the latter days of her life, a very ill smell proceeded; but no pus ever was observ'd to have been discharg'd therefrom. Under these symptoms, she drag'd on life much longer, than could have been suppos'd from her pulse, which, besides its being already small, and weak, frequently became smaller, and more weak, particularly in the last fifteen days, when she took nothing but broth, and a little wine, as she could now bear no kind of aliment besides, and much less medicines.

This lean carcase was brought into the anatomical theatre, when, as I was teaching anatomy, in the month of February, of the year 1744, and had
already

already demonstrated the male organs of generation, the female organs were wanting. The belly, therefore, being open'd, I saw the omentum roll'd up towards the upper part of that cavity, and extended so, that the transverse arch of the colon immediately occur'd to the eye, being now below the navel, whereas it generally lies immediately below the stomach. Into which situation it, probably, might have been push'd down, by the stomach, in some measure, though not entirely, as the left part of the fundus, of this viscus, descended lower than usual.

And the stomach was even livid externally, and particularly in a very considerable part of it, and had, at the same time, its coats very much thickened, and hardened, unless where they were, already, become so rotten as to be broken through with a touch, and to discharge a matter of a cineritious colour, and of a very strong smell, which, like a kind of fluid pulstice, was contain'd in the cavity of the stomach. Into this cavity, it had burst out of the posterior paries of the stomach, which was immoderately thick, to a great extent, and internally tumid, and, in the same place, unequal, in a corrupt, rotten, and gangrenous state, and of the same lurid colour as the foremention'd matter was, so as to make it certain, that a tumour, or abscess, of the worst kind, had been ruptur'd in this place.

The pylorus was found, and all the intestines, among which was the colon, were, as it is reasonable to suppose, after so long an abstinence from food, contracted, from the beginning to the end. The spleen also was found, except that it was, in proportion, larger than usual, and, internally, somewhat pale. But the right part of the liver shew'd some roundish and white schirrh, about the size of small grapes. These tumours lay at a little distance from each other, on the surface, in such a manner, as to be, in some measure hidden, within the substance of the viscus; and when I cut into the liver, I saw one of them, which was intirely similar to the others, that was quite buried within the substance. There was a great quantity of bile in the gall bladder, which was extremely yellow, and had ting'd the neighbouring parts with the same colour.

The posterior surface of the left kidney had an oblique line upon it, to a considerable length, and of a whitish colour, made of a kind of tendinous substance, as it were, which, as I perceiv'd, when I cut into the kidney, was carried to a great depth, so as to reach to the tubuli, in which the papillæ are receiv'd. You would have been ready to suppose, that it was the cicatrix of a former ulcer, so much similarity had it thereto: but no where did there appear any mark of injury, though we look'd for it in the neighbouring tunica adiposa, and in the muscles of the belly.

The uterus was small, and low, and very much inclin'd to the right side, so as to be much nearer to that side, than to the left. But the round ligament was, also, shorter on the right side, than on the left. The cervix uteri, and still more the os uteri, were nearly in the same state, in which they are generally found, in virgins; for the former was internally mark'd, with its oblique, and prominent rugæ, and the latter had its aperture very round, and narrow. Nor was the ring of the hymen wanting, notwithstanding it was very low, and shew'd no traces of rupture. Yet behind it, were none of those roundish caruncles, and but

very

very few rugæ in the vagina, and these very slight, and the skin, which at the lower part of the abdomen, I observ'd to be, as it were, of a whitish colour, and spotted, did not greatly agree with what I had observ'd before.

The testes, in proportion to the age of the woman, and the bulk of the uterus, were large, and externally convoluted; but internally, the left had a kind of small and empty cells, wrap'd up in a white, and thickish membrane, and the other contain'd, in a cell, not much larger than those, a black, and half-concreted blood. The right falopian tube was pervious to the ovarium, but in the remaining part shut up; on the contrary, the left was open only to the uterus. It was surprizing in so lean a subject, except we allow for its being a female body, that there was so considerable a quantity of fat in the mesentery, and that even some remain'd in the omentum, and that in the interstices of the muscles, also, on the back, and the limbs, a much greater quantity was found, than those who prepar'd the body would have wish'd; and these muscles were of a very elegant red colour.

Beneath that yellow fat, with which the mesentery cover'd the vertebræ of the loins, and the trunks of the large vessels, that adher'd to them, some glands lay hid, which were enlarg'd to a great degree, and so closely connected to those vessels that they could not be separated, without great difficulty. All these glands were internally white, not very hard, but abounding with a purulent ichor. The others, throughout the mesentery, were not enlarg'd. But near the stomach, I observ'd one of the lymphatic glands to be grown much thicker, than natural, and harder, and to be of a lurid colour.

I then also saw, that the pancreas was universally thicken'd, and, at the same time, somewhat dry, and become a little hard, if you except a certain part of it, which had grown out into a white substance, almost like the thymus.

When we open'd the thorax, we, first of all, found the two lowest jugular glands to be of a whitish colour, and enlarg'd in every one of their dimensions, to the breadth of two inches, at least. These glands made up that hard tumour, on both sides, which I mention'd before; for they were also found to be hard, notwithstanding that on the inside, they contain'd a purulent ichor, part of which flow'd out, while the clavicles, under which, and the neighbouring part of the sternum, these glands harbour'd themselves, were taken away. The other jugular glands were, also, similar to these, in colour, and hardness, and in the ichor they contained. Yet these had not grown out into so large a bulk.

The axillary glands, however, had not been encreas'd in their bulk, nor undergone any other change whatever. On the other hand, those that are plac'd at the first division of the aspera arteria, were of a blackish colour, mix'd with white; and from a very small size, were become not less than middle-siz'd grapes: they were likewise pretty hard, and abounded with the same kind of purulent ichor, which I said was contain'd in so many other glands.

Yet the aspera arteria itself was found, even in the neck, as the whole tract

tract of the œsophagus was, in like manner, from the upper part, to the lower. Nor was any disorder observ'd in the lungs, which were somewhat turgid with air: nor yet in the heart, if you except some roundish tubercles, of a depress'd figure, made up of a somewhat hard, and compact substance, and so frequent, as to be almost contiguous to each other, which beset the whole borders of the mitral valves; and in one of the femilunar valves, a kind of small scale that had grown to it, but was not yet become bony.

Finally, the brain was not only not lax, but inclining to hardness, yet seem'd to be nearly in its natural state, unless that in the lateral ventricles, there was some quantity of a pellucid water, and the plexus choroides was pale. But the pineal gland was a little more firm, and globular than usual, and inclin'd more to a white colour, than it generally does. And, notwithstanding most persons, now, do not take this for a gland, yet I thought it might not be amiss, to take notice of this circumstance, in a body wherein so many glands were observ'd to be diseas'd.

13. The same observation makes us suspect, that the beginning of this long disease, which at last carried the woman off, was in some gland of the stomach, which being gradually encreas'd, and grown hard, afforded, by its tumefaction, an obstacle to the course of the blood, for which reason it burst forth, more than once, from the neighbouring vessels that were dilated, and particularly, in a woman who made a free use of generous wine, and salt provisions. And after that by this kind of intemperance, not only the bulk of the gland, and the extension of it, had been by degrees, more and more, augmented; but also the nature of the included humour had become more deprav'd, a purulent corruption, at length, came on, from whence, even before the tumour had any aperture in it, so great a quantity of ill-condition'd ichor had been thrown into the small veins, and the lymphatic vessels, that many other glands were infected with the same taint.

If the woman had liv'd some time longer, it is not difficult to foresee, by way of conjecture, what would have happen'd to the pancreas, and the scirrhi of the liver. As to there being a great quantity of bile in the gall-bladder, it is not at all surprizing, as I said in the preceding letter (1), that this should happen, where, for a long time, nothing had been contain'd in the stomach, and the upper part of the intestines, which by distending them could compress this receptacle. And as to the neighbouring parts being ting'd with the colour of the bile, this is a circumstance which happens so frequently, in dead bodies, that in regard to accounting for any disorder therefrom, it is somewhat more natural to follow the last scholium, which is subjoin'd to the sixteenth observation, in this section of the Sepulchretum, rather than the observation itself, especially in this case, where there was in the several parts of the body so great a number of real, and certain, appearances of disease.

However, if you should desire to have other examples of tumours, or abscesses, in the stomach, besides those which are to be found in this, and the next, that is the eighth, section of the Sepulchretum; you will find some to add to them, among the monuments of the Cæsarean Academy (m), and

(1) N. 6. (m) Dec. 3. a. 5. obs. 175 & a. 7. obs. 142. & cent. 3. obs. 13.

from other books besides, but in particular, from the works of Frederic Hoffmann (*n*).

14. An old woman had, already, lain some months in this hospital, on account of a tumour which rais'd up her belly, about the navel, and below it, but more on the right side, than the left. For which reason she could not lie down on her left side. The tumour was really large, but seem'd larger, for this reason, that the hypochondria, and most of the other parts of the belly, had subsided much, from a loss of flesh, which was universal through the whole body, but most considerable on the left side: could this happen because the woman always lay on her right? The tumour seem'd very moveable, if you took hold of it betwixt your hands, and push'd it to one side, and to the other. And it had scarcely any pain.

On the other hand, there was a perpetual complaint of a kind of uneasy sensation, in the stomach. For which reasons, some were ready to conjecture, that this tumour was in the omentum, by which means the stomach was drawn downwards, and troubl'd in its functions. With this uneasy sense in the stomach, there was sometimes a desire to vomit, but no vomiting. And now there was, besides these symptoms, a continual kind of fever, which continued, in conjunction with all the other symptoms, that I have spoken of, even to the very close of her life, that is to the middle of October, in the year 1735.

The belly being laid open after death, it was evident that the tumour was in the right ovarium: which had grown out into cells, full of a soft matter indeed, but not fluid, and of a cineritious colour inclining to yellow, but without any disagreeable smell. The tumour was increas'd, by the neighbouring tube being condens'd with it, which was, also, much enlarg'd, and become pretty thick; whereas the uterus, and the other parts that belong to it, were only of their natural size, and in a sound state. This tumour was connected to the contiguous side of the pelvis, and in some measure, also, to the nearest intestines, so that it could be more or less mov'd, by means of moving these parts. The intestines were livid from inflammation: yet they had no bad smell, nor yet the stomach, which was brought to me, by the person who dissected the body, and by whom, the other circumstances, that I have hitherto set down, were accurately related, that is by our Mediavia.

The reason of his bringing the stomach to me, was that I might, after having examined it, clear up a certain doubt of his. The cavity of it was very much contracted, on its internal surface, here and there inflam'd, in several places, and in the very middle of the neck, or upper part of the stomach, was an ulcer, nearly of a circular figure, which, in its diameter, was somewhat shorter than three fingers breadths, and of a very small depth, as in it there appear'd to be a great number of lenticular glands, of a middle size, and so very manifest, that I inserted a bristle into an orifice, which was seen in the center of them. Yet this ulcer was surrounded with pretty thick lips: and the substance of the coats of the stomach was become more thick, and hard, in that whole space which corresponded, externally, to the ulcer, than in any other part.

(*n*) Medic. Rat. t. 3. §. 1. c. 7, §. 26.

But as the stomach was entirely perforated, almost in the middle of the ulcer, Mediavia enquir'd of me, whether I imagin'd that this foramen could have been accidentally made, with the knife, in taking out of the stomach; for he affirm'd, that nothing had been found in the belly, besides a little serum, in the lower part of the pelvis, which could be suppos'd to have been extravasated, out of the stomach, whereas it seem'd that much ought to have been effus'd, in consequence of the patient having been, constantly, in a recumbent posture.

I however, although I thought it but little probable, if the stomach had really been cut by the knife accidentally, that this should have happen'd in that part, in particular, which corresponded to the middle of the ulcer, nor did the figure, and magnitude, of the foramen, which was almost capable of admitting a little finger, seem to be of such a kind, that they could properly be refer'd to the point, or the edge, of the knife; yet that I might satisfy both him and myself, as we were both equally desirous to know the truth, I examin'd with accuracy, a second, and a third time, the edges of the ulcer. And when I saw them to be not only callous, but unequal, and the more the foramen went towards the outside, to be comprehended in the less circumference, which two circumstances, the knife certainly could not have been the cause of, by having cut from without inwards; I judg'd that this aperture was not to be attributed to the knife, but to disease.

For as to nothing having been extravasated, from the stomach into the belly, that might have happen'd for this reason, that the external membrane was, by degrees, extenuated, and not entirely eroded, or perforated, till the disease was come to the last extremity, and life was at the close, at which time the stomach of the dying woman, being corrugated, and contracted, had nothing at all to pour out.

15. I lit, afterwards, on an observation of Mercklin, which you will also find to be related here, in the Sepulchretum (*o*), that is, of a foramen, big enough to admit the extremity of a man's thumb, with ease, seated, in like manner, in the upper part of the stomach, at which part there had been, for many years, a continual pain, not very considerable indeed, but always pretty troublesome. And that foramen was also suppos'd, by this learned man, to have been open'd after an old erosion, but only in the latter part of life; for he judg'd that life could not have been drag'd on so long, if the food that had been taken in formerly, had been effus'd into the cavity of the stomach, as he observ'd some, which was taken in the day before her death, to have been.

In the same manner, likewise, you will explain a much more recent observation, that you read in the commentaries of the illustrious Academy of Sciences at Petersburg (*p*), of a fissure in the stomach, through which nothing had been extravasated into the belly, and which, nevertheless, the credible, and expert dissector denied, upon his oath, having made with the knife: for that stomach was, also, manifestly eroded, particularly in the part which is opposite to the fundus, and had been the stomach of a man,

(*o*) Obf. 48.

(*p*) Tom. 7.

who

who had a perfect resemblance to a consumptive person, and who had died of constant vomitings, which no remedy, or art, could appease.

Neither was any thing found to have been effus'd, into the cavity of the belly, by Tyfon (*q*), (who is even said to have found a perforation in the human stomach, three times) in an American, in whom he found the same kind of fissure. I do not, here, speak of those perforations, from which nothing could have flow'd down into the belly, either because they open'd into the colon, which was agglutinated, as it were, to the stomach (*r*), or because they were stop'd up by a part of the liver, which had grown to them (*s*). I also pass over those cases, in which it is not said, whether there was any effusion, or not (*t*). When there has been an effusion of the contents of the stomach, into the belly, I see that either a very speedy death was the consequence (*u*), or, at least, that frequently it was not delay'd more than a very few days (*x*), if we reckon the days of the perforation, from the day of the disease being become very violent, as it happen'd in an observation of the celebrated Baron (*y*), which certainly deserves well to be read, who, although he tells us that death did not follow till the eighth day, yet at the same time admonishes, that the foramen was in the upper, and interior, part of the stomach, so that it would have been very difficult for any thing that was drunk, to be extravasated into the belly, unless after some time, and in particular motions of the body. And I made use of the word *frequently*, for this reason, because I know that some observations are even extant, of the stomach being perforated, in which either that is not quite clear (*z*), or the contrary seems rather to appear (*a*). But you will compare these circumstances together, and consider them.

16. And although all, or the greater part of, these foramina, found in the stomach, relate to ulcers, which have sooner, or later, entirely pervaded the coats of this cavity; yet you have, here, in the Sepulchretum (*b*), many other observations of the same viscus being ulcerated, both internally, and externally, notwithstanding some are repeated, as the letter fifth (for the same number five is set down over again, through neglect) in the forty-third observation, article the fourth, and the sixth, in the twenty-seventh, under article the second. But although there are repetitions, also, of other observations, that relate to different disorders of the stomach, as of that which is under number twenty-six, article the fifth, in the twenty-fourth; there is no repetition that is more worthy of excuse, than where the twentieth is repeated, in the additamenta, under number two. For who would have imagin'd that the observation which had been propos'd by Blancardus, as if it had been taken from "a citizen" of his "city" of Amsterdam, was the same with that which Riverius had already given, as taken from a

(*q*) Vid. aët. erud. lipf. suppl. t. 3. f. 4.

(*r*) Sepulchr. f. hac 7. obf. 13. f. 1. & Brunner Gland. Duoden. c. 9. & Haller. opusc. pathol. obf. 23.

(*s*) Sect. ead. 7. obf. 5. secunda, & in addit. obf. 3. & eph. n. c. cent. 3. obf. 13.

(*t*) In schol. ad. obf. 3. modo cit. primo & tertio loco, & sect. ead. obf. 7. §. 1.

(*u*) Eph. n. c. cent. 5. obf. 43.

(*x*) Earund. cent. 3. & 5. obf. 120. & Sepulchr. l. 3. f. 21. obf. 25.

(*y*) Memoir. present. all' acad. r. des. sc. tom. 1.

(*z*) Sepulchr. l. 3. f. 8. obf. 14.

(*a*) Eph. n. c. dec. 3. a. 9. obf. 91. & cent. 1. & 2. obf. 151.

(*b*) Adde & seq. viii. sectionem.

goldsmith of Montpelier; unless any one who, having learn'd the ingenuity of Blancard, in transforming histories, and remembering a similar observation to have been given by Riverius, had compar'd both of them together, and not only found them similar to each other, but had found that they were, very evidently, altogether one, and the same?

But to return to those that relate to ulcers, among others, the forty-eighth deserves well to be read; for it is my opinion, that if this could have been extant, a hundred and twenty years before, it would have prevented Gesnerus, not to mention others, from being so ready to publish that which you have here under number thirty-six, of lizards for instance, and serpents, being generated within the viscera, and killing with the permission of the almighty, "about three thousand men" by the most cruel pains. For, to pass over the reasonings, and admonitions, of our Vallisneri (*c*), which I could heartily wish had been read, and duly weigh'd, by many of those who went on to publish observations of this kind, afterwards, without any doubt, or hesitation; at least, in that forty-eighth observation, also, which I just now quoted, the history of a man, is copied from Hartmann, who was so firmly persuaded of his having a lizard in his stomach, that he made no scruple to delineate the figure of it, and another is spoken of by Lucas Antonius Portius (*d*), who asserted that he had a frog in the same place, which sometimes croak'd, and if he drank any water, swam about in it, and not to use many words, you will find from Brunnerus (*e*), that a woman, by reason of a biting, and other sensations, which she felt in her stomach, was suppos'd to nourish a living animal there. Yet this woman, instead of her living animal, and the last of the two men, instead of a frog, and the first, instead of a lizard, had only tumours of the stomach, which were, for the most part, ulcerated.

I would, therefore, have you add to the Sepulchretum, the two more modern histories, out of these three, with their signs, whatever they are, and their dissections. For there are not only some others to be added, from the less modern histories, as for instance, that which you will read in Freherus (*f*), of the very famous cardinal Baronius, who was destroy'd by an insupportable nausea, which arose from three ulcers in the mouth of the stomach, but also from the more modern in particular, many, as one of Brunnerus (*g*), with an ulcerous tumour, as that of Basterus (*h*), which is, in general, not much unlike the former, as two of the celebrated Plancus (*i*), both of a callous ulcer, and others, in like manner, among which are some of the celebrated Haller's; for besides that of a scirrhus stomach from the abuse of vinegar (*k*), he has two others, one of which (*l*), describes many tubercles therein, full of pus, the other (*m*), describes the stomach, as being extremely deform'd with scirrhi, and abscesses, betwixt the membranes,

(*c*) Consideraz. int. alla generaz. de' vermi.

(*d*) Vid. act. lipf. a. 1704. m. Septembr.

(*e*) Gland. duoden. c. 9.

(*f*) Theatr. viror. erud. clar. p. 1. f. 2.

(*g*) C. 9. cit.

(*h*) Act. n. c. t. 8. obs. 16.

(*i*) Epist. ad. put. a. 1726. & epist. ad eund. de monstr.

(*k*) Opusc. pathol. obs. 21.

(*l*) Ibid. obs. 22.

(*m*) Ibid. obs. 23.

where it adhered to the colon, with which it communicated, by means of an ulcerated passage that lay open.

For, as you read over, attentively, all these observations, beginning with that of Hermannus, and adding another, moreover, of the celebrated Goritzius (*n*), you will readily observe, that there are but very few, in which there was not an injury, either in the pylorus, or near the pylorus; so that for this reason, also, the opinion of Frederic Hoffmann (*o*), may seem to be, for the most part, at least, not very absurd, or contrary to truth, I mean that the pylorus is primarily, and principally, affected in a cardialgia, especially, as in the next, and eighth section of the Sepulchretum (*p*), we read that the stomach was internally corroded, also, near to this orifice, and in this (*q*), that the orifice, itself, was not only very much swell'd, externally, and had vomicae fill'd with white pus, but was likewise scirrhus, on the internal surface, and beset with whitish, and indurated glands, more than the other part of the stomach.

Moreover, as you see that in the observations, which I have quoted from Hermannus, and Basterus, either glandular, or fungous, excrescences of the pylorus were join'd, in such a manner, with ulcers, of this part, that they might be suppos'd to have grown out from the ulcerated substance of the pylorus itself; you will without doubt, enquire, whether the other excrescences, which other persons, and I myself, also, have sometimes seen, both at this, and at other parts of the stomach, are all of them to be suppos'd to have proceeded from some ulcer of that viscus? For you see, by way of example, in the additamenta to this section (*r*), that two verrucae, or warts, were observ'd by Paulinus, in the stomach, about the left orifice, "adhering firmly together with their roots," one of them of the size of a small apple, the other of the size of a pretty large filbert, but that no mention is made of any ulcer, from whence they arose; although, some time before, a mass, equal to the size of an acorn, had been thrown up by vomiting, with a large quantity of blood: and indeed we generally see warts upon the skin, externally, without any ulcer.

But, as to what the Arabian Physicians have written, upon warts of the stomach, you will read it in Marcellus Donatus (*s*), and you have it in part, also, in the scholium to the appendix, which is subjoin'd by Bonetus, to the thirteenth observation of this section: although as the wart, which is there spoken of from Avenzoar, was of the bigness of an apple, it is not easily understood, how it was possible for it to get out of the stomach, and be thrown through the small intestines, into the large intestines; so that it is very natural to suspect this excrescence not to have been generated in the stomach, but in that part of the colon (*t*), which is contiguous to the fundus of the stomach, especially as vomitings are never said to have been observ'd in that patient, but, always, stools of a morbid appearance, sometimes bloody, and sometimes of various colours.

(*n*) Eph. n. c. cent. 8. obs. 20.

(*o*) Commerc. litter. a. 1731. spec. 44. in fin.

(*p*) Obs. 4.

(*q*) In Addit. obs. 6.

(*r*) Obs. 5.

(*s*) De med. hist. mirab. l. 3. c. 5.

(*t*) Vid. etiam epist. 31. n. 21.

17. However in regard to what the Arabians have call'd warts, which, if they were not polypi of the intestines, or of the stomach (of which kind nearly, I should suppose that fleshy substance to have been, that is describ'd to have been thrown up after many vomitings of blood, in the appendix, of which I spoke just now) might be fleshy excrescences, as the verrucæ of Paulinus might also be, which in some measure resembled warts, that were pendulous from a root; if you choose to suppose that these ow'd their origin to a kind of ulceration, or erosion, I shall not be repugnant to your opinion. But I will rather enquire, whether you are to suppose the same thing of some others, as for instance, of that pretty large glandular caruncle, which was fix'd to the stomach, near the ring of the pylorus, by an oblong stalk, or radicle, which, as it is describ'd by me to you, in the sixteenth letter (u), you may compare with that which is given in the Sepulchretum, from our Prævot (x), which is said to have been annex'd to the same part of the stomach, by an oblong membrane, and was, I suppose, like mine, in this circumstance also, that it was not injurious.

For although it is thus said thereof in the Sepulchretum, "this body "falling into the pylorus, without doubt, all the exit of the chyle might "have been entirely prevented, and various symptoms might have arisen;" this exit is not, therefore, said to have been prevented, or these symptoms to have arisen; so that it by no means appears, why this title was prefix'd to the observation, "a consumption from, a glandulous caruncle adhering to "the pylorus." To me, I confess, excrescences of this kind, which are seen to hang pendulous from the skin, in some persons, and are number'd, by some, among the marks of the mother, seem to have almost a similar origin, which does not relate to ulcers.

Yet I would not deny, but it may possibly happen, that from accidental injuries, these marks may be broken, and ulcerated. So in one or two persons, and particularly in an old man, whom I shall describe to you hereafter (y), among those who died of a blow on the head, I saw a kind of membranous flap, or fold, hang from the ring of the pylorus, in a lacerated state, so that you could not doubt, but it had formerly been larger, nor was it as yet quite sound on the extremity of its edge. There are also, other verrucæ taken notice of by me, in the same ring, not pendulous, but sessile, or dwarfish, as it were, as in a porter, whom I shall speak of hereafter (z), as having fallen from a house, and broken almost all his ribs, and, in like manner, in an old man, of whom I shall make mention (a), when, in treating of the gonorrhœa, I touch upon the disorders of the prostate gland. For in both of these bodies, two roundish corpuscles, of the bigness of a vetch, adher'd to that ring, in the first of them, somewhat livid, in the second, of a red colour, and in both of a glandular substance. And indeed in the second, they discover'd, each of them, their separate little foramina, though in a somewhat obscure manner, which we could see in a more large, and more clear state, in the nearest lenticular glands. For these this man had very much enlarg'd in their size, in the continuation of the antrum

(u) N. 36.

(x) L. 2. f. 7. obs. 138.

(y) Epist. 52. n. 8.

(z) Epist. 53. n. 37.

(a) Epist. 44. n. 19.

pylori, through which, two or three prominent lines were drawn longitudinally, and terminated in those two roundish tubercles: and upon each of these lines, two or three glands adher'd, being disjoin'd by some little interval.

These lenticular glands, of the stomach, call back to my mind, another observation thereof, that relates particularly to this occasion, as it was not taken from a man, in whom no signs of a disorder in the stomach had exist-ed, which, to the best of my knowledge, there had not been in those just now taken notice of, but from one who was taken off by short, indeed, but very violent, pains of the stomach.

18. A man of forty years of age, of a muscular habit, and much given to intense thinking, had, for some days past, been troubled with a pain in the head, and a sense of heat in making water, when after a supper, in which he had neither eaten too much, nor any thing that was unwholesome, he was seiz'd with violent pains in the region of the stomach. The pain of his head continued. Those of his stomach were increas'd. A great quantity of green matter was discharg'd by the intestines, and by the mouth. And with these symptoms, he died at Venice, on the beginning of the third day, which was in the middle of August, in the year 1707.

When the stomach was open'd, the right part of it was found: and therein I saw, in conjunction with my learned friends, a great number of lenticular glands, in the manner I have describ'd in the third of the *adversaria* (*b*). The left side of this viscus was mark'd, in its fundus, with bloody spots, and these of a lively red: among which, some that began to be cover'd over with an ugly ferruginous little crust, show'd that the disorder had already inclin'd to a gangrenous state. On the same side, where there were no spots, and where the internal coat seem'd to be found, I could easily press out the blood. The duodenum, and the rest of the intestines, even when examin'd internally, had no appearance of disease. The gall bladder was contracted at the distance of two, or three, inches from the lower part of its fundus, and was again dilated, before it terminated in a cystic duct, so that it might seem to be divided into two vesicles.

The lungs adher'd, by means of their own substance, to all the parietes of the thorax, being connected in the same manner also, to the mediastinum; they were found however; for as to their being red, on their posterior part, the back, and the posterior parts of the arms, were ting'd equally of the same colour. Nor was there any blood, either in the heart, or in the auricles. In the other parts, all of which I examin'd, except the brain, there was nothing worthy of remark.

19. No great error, or irregularity, in point of living, had been committed by this man, as had been by him, whose stomach the celebrated Koehlerus (*c*) found to be inflam'd, and beset with black spots: there was not the least suspicion of a medicine which had been of a nature not suitable to his stomach, as was the case in the history given by Klaunigius (*d*), or as you read, more

(*b*) Animav. 4.

(*d*) Eph. n. c. cent. 3 & 4 obs. 145.

(*c*) Commerc. litter. a. 1743, Hebd. 5.
n. 2.

than once, in this section of the Sepulchretum, of poison being either fraudulently, or accidentally, given. And some things had even preceded, as you might have observ'd, which seem'd to discover a considerable acrimony of the blood. Yet if you should happen to be surpriz'd at any thing, in this history, you will still more be surpriz'd, in that of a woman, which I have already promis'd you (e), and will at present give you.

20. A poor country woman, to appearance about fifty years of age, had been subject, at intervals, to a difficulty of respiration, join'd with a sense of streightness, a hard pulse, and a violent agitation of all the arteries, so that the alternate motion thereof, fell under the notice of the eye, even in her very hands, and not only in the neck, and the temples. When her respiration was extremely difficult, she came to this hospital, and having lost a large quantity of blood, which was somewhat hard in its consistence, she was freed therefrom. Thus she liv'd four years, when being seiz'd, at home, with pains of the stomach, she died there, within four and twenty hours.

Her body was given to me, that I might teach anatomy from it in public, before the latter end of January, in the year 1737. As we examin'd every part in its order, these things seem'd worthy of remark, in the belly. The stomach was large, and half-full, and when we came to open, and examine it, we were surpriz'd that the contents had not been thrown up by vomiting. For it was ulcerated with many, and various erosions, which seem'd recent, and were already affected with a gangrenous blackness. Some of them were very thick, and very small, at the upper part of the stomach, some of which kind were, also, seen in the nearest part of the duodenum: others were at a greater distance from each other, and larger, in the fundus, and more so, where the stomach began to expand itself from the termination of the œsophagus: nor was the œsophagus, itself, free from erosions of the same kind; so that they seem'd to have been caus'd by the food which had been taken in, though of what kind this food had been, there was no certainty, nor could we form any tolerable judgment, from the matter which remain'd in the stomach.

The spleen was somewhat larger than it naturally is, and more lax, being connected, in the greatest part of it, to the diaphragm, and in some part of it, to the stomach, which it is possible might arise from the encreas'd magnitude thereof. The uterus was very much inclin'd to the left side; and for that reason the round ligament was much shorter on the left side, than on the right. To one side of the cervix uteri, internally, a membrane of a pyramidal form adher'd, that had its upper part flatten'd, being small in its size, thickish and white, which I judg'd to be the remains of an hydatid, that was formerly distended with water. The urinary bladder, quite from the orifices of the ureters, show'd the sanguiferous vessels very conspicuous by their redness; so that notwithstanding they were very minute, the communications of one with the other, could not have been more clearly seen, if they had been fill'd by an injection of red wax. In this manner they were continued, in very great number, on both sides, into the urethra, the internal surface of which

(e) Epist. 14. n. 35.

was taken up with them in a still greater degree; but, for this reason, they were not quite so beautiful as in the bladder.

In the dissection of the mesentery, which abounded with fat, and that of a very good colour, and consistence, as the other parts did likewise, more than you would have suppos'd from first sight, I saw glands which were found indeed, but much bigger than usual, as many of them were even equal to beans of the largest size. The beginning of the superior mesenteric artery was common alio to the coeliac. The coronary of the stomach had a much larger diameter than usual. But the vena cava, while it was cut through, above and below the liver, as is the custom in anatomical theatres, did not pour out a single drop of blood.

Both cavities of the thorax had a little water in them, which was ting'd with no colour at all: the lungs were turgid with air, and connected to the pleura, on the back-part, and on the sides. In the heart, and in the jugular veins, in which there was a larger quantity of blood than in the inferior veins, was some appearance of a polypus. The parietes of the heart were, evidently, much thicker on the left side, than they ought to be, whereas, on the right side, they seem'd to be thinner than was natural. Yet there was no dilatation of the ventricles, or of the veins, or of the pulmonary artery, or, finally, of the trunk of the great artery. There was, indeed, somewhat of a hardness in the valves thereof, and in the trunk itself, both near the heart, and in other places up and down, in like manner, which were the marks of ossifications, that would have taken place, if the woman had liv'd longer, though discover'd, at present, only by a kind of yellow colour, and were even already grown very hard, a little above the diaphragm, where they were larger, and more protuberant: but the trunk was, every where, of its proper diameter.

Yet it was not so in all the branches of that trunk. For besides that coronary, of which I have spoken already, when I compar'd the carotid arteries one with another, a greater breadth was evidently to be seen, in that on the left side, than in the other. And as the left of these arteries, after having scarcely measur'd out an inch and a half in length, from its origin, was divided into two branches, by a very extraordinary instance, it was somewhat more dilated, where it began to divide, than arteries are accusom'd to be, in most persons, at their distributions: and the same thing I observ'd, at the first division of both the subclavians, into the larger branches.

At length, having open'd the cranium, on the twenty-eighth day, after the woman's death, the brain was not only without any morbid appearance, but had even no disagreeable smell, nor was found, in any respect, worse than others, that I dissected at the same time, which were much more fresh.

21. In the thickness of the parietes of the heart, on the left side, being preternaturally encreas'd, you have a part of that cause, which so violently agitated the arteries, and in the several dilatations of these arteries, and the many beginnings of ossification, the effects of the same agitation: all which circumstances, you may compare with those things that I have already said upon the subject of spurious aneurisms, as Lancisi call'd them (*f*).

(*f*) Epist. 24. n. 35. & seq.

You have, moreover, which particularly relates to the present purpose, the causes of a most severe pain of the stomach, in the erosions of that viscus. And as I also found erosions, pretty similar to these, in a short time after, in the stomach of a drunken man, describ'd in the fourteenth letter (*g*); to omit those appearances, which I describ'd just now, as having been seen, by me, in that Venetian (*h*); I am much in doubt, whether to attribute them all to I know not what kind of food, that was taken in, or rather to some poisonous juices generated internally. Yet though I might perhaps do this, with some degree of colour, in one of these histories; it seems, however, less possible to suppose it in the last, in which the passage to the stomach, that is the œsophagus, was also beset with the same erosions.

But in regard to the effects of poisons, observ'd in the stomach, by means of dissection, as I should rather chuse to treat of them, at once, in their proper place, than here and there irregularly, as I see is done in the Sepulchretum; I shall, for this reason, refer to that proper place (*i*), what I forbear to add at present: as for a like reason I shall also defer to another occasion, those things which relate to the pain of the stomach, from a consent with other parts, and particularly with the kidneys.

22. But in regard to those pains of the stomach, which arise neither from poison, nor are produc'd from causes that lie on the outside of the stomach, if you enquire after such things, as you may add to those you have read above; I think you ought to add, in the first place, the observation of the illustrious Heister (*k*), in which he describes a most violent cardialgia, brought on by a great heap of worms, which had so injur'd the stomach, about the left orifice, where he found them adhering, that it was bloody, and, in a manner, eroded: and this in an adult woman; not in children, in whom it is less surprizing, that almost similar appearances were found by Bonetus, and by our Saxonia, as you have it in this section of the Sepulchretum (*l*). And although many examples (*m*) are given, in the same section, of a pain of the stomach, from calculi, that were form'd therein; yet you may add fresh examples from Lanzonus (*n*), from Contulus (*o*), and others. Farewell.

(*g*) N. 34.

(*h*) N. 18.

(*i*) Epist. 59. n. præsertim 21.

(*k*) Eph. n. c. cent. 5. obs. 86.

(*l*) Obs. 14.

(*m*) Obs. 29. 31. & 32.

(*n*) Aët. n. c. t. 1. obs. 64.

(*o*) De Lapidibus, podagra, &c. c. 9.

LETTER the THIRTIETH,

Treats of Vomiting.

1. **W**ITH the pain of the stomach, which was treated of in the former letter, is frequently join'd vomiting, of which I am to write at present. And this you may observe, not only by reading the last letter; but also by turning over the eighth section of the Sepulchretum, and comparing it with the seventh. For you will find many observations, in which both of these symptoms are describ'd, and not a few which are equally describ'd in both sections.

We however shall keep steadily to our former resolution, and shall not produce any one of those here, which we have either given already, or are to give hereafter. I select, therefore, out of all these of Valsalva, two only; one relating to a long-continued, the other to a short vomiting, but both of them to a vomiting which had fatal events. The first of these observations is as follows.

2. A man of about fifty-four years of age, had begun, five or six months before, to be somewhat emaciated, in his whole body, when in the beginning of the month of August, of the year 1689, a troublesome vomiting came on, of a fluid which resembl'd water, tinctur'd with foot. And the same kind of fluid was discharg'd by stool, sometimes, when the vomiting was upon the patient, and, sometimes, when it was absent, but this discharge was not constant. In the mean while, scarcely any pain was perceiv'd, in the region of the stomach. But the physician having prescrib'd salt of wormwood, it created such uneasiness in the stomach, that it was never given afterwards. At length the vomiting being very violent, with a discharge of the same matter, and the pulse growing, by degrees, very languid, death took place of life, on the thirteenth of November.

All the limbs of the body were flexible: which does not often occur in other carcases. In the stomach, towards the pylorus, was an ulcerated cancerous tumour, and this seem'd to be made up of a congeries of glands, which, being press'd, discharg'd a kind of humour, like the male semen. And the stomach contain'd three pints of a matter, almost of the same nature with that, which was thrown up by vomiting. Betwixt the stomach and the spleen were two glandular bodies, of the bigness of a bean, and in their colour, and substance, not much unlike that tumour which I have describ'd in the stomach. These were the appearances in the belly.

And in the thorax, the right lobe of the lungs was somewhat inflam'd on the posterior part: but serum issued forth from both of the lobes, in eve-

ry part, when cut into. From the right ventricle of the heart, polypous concretions went into the pulmonary artery: and a small one from the left, into the pulmonary vein.

3. If you compare, one with another, the two tumours of the stomach, I mean this, and that which I also describ'd from Valsalva, in the former letter (a), both of which he call'd by the name of cancer, in the short references to his observations, and has said that both of them had a vomiting attendant upon them, by which a fluid, like water ting'd with foot, was discharg'd; you will perhaps wonder why the former occasion'd such severe pains, and this so slight, and why this, as, when press'd, it gave out a humour that was not fuliginous, could, nevertheless, be able to tinge so great a quantity of humour, with that colour. But that a very black matter has been thrown up, even by those who had no tumour of this kind whatever, you will not only perceive from the observations of others, but also from one of those which will be given below; so that it is by no means necessary to account for colours of this kind from cancers of the stomach, that are become ulcerated.

As to that difference of pains, however, unless you account for it, in the first patient, from the humours being more irritating, than in this, as the first was a pretty old man, and of a bilious temperament, although in the last, the pains became very troublesome, by the taking of salt of wormwood; you will conjecture that there had been slight pains in this latter patient, at first, just as there were in the former, but that after the tumour was so irritated, by the salt of wormwood, as to be at length ulcerated, they not only became more violent, but continued to the very close of life.

4. A nobleman of two and forty years of age, having come out of Germany into Italy, was seiz'd a few months after, with a double tertian fever, at Bologna, which was attended with pretty mild symptoms, in its first accessions; but in its fourth accession was very violent indeed. For the cold fit, which began about the twentieth hour, did but just remit at the third hour of the night: his thirst was very troublesome, his tongue rough, his breathing difficult, he felt a lassitude, had a small and weak pulse, a pain, and sense of fulness, in the stomach, and, finally, so great was his restlessness, and anxiety, that he scarcely remain'd two minutes together, in any one part of the bed.

All these symptoms continued without any remission, till, the heat coming on more violent, the patient had leave to drink a draught of distill'd waters, when they began to abate; but they abated only a little, and for a short time. For soon after all the symptoms were again exacerbated, and continued violent, through the whole night. Early in the morning he found that he had a vomiting coming on: but, at first, he could not excite it even by thrusting his fingers into his fauces; yet soon after, he threw up a fluid to the quantity of four pounds, and this fluid was like water, in which chocolate has been dissolv'd. In this humour floated some small portions of membranes, as it were, which had the very same colour: and the odour of it was of the same kind with that which generally exhales from the bodies of patients labouring under fevers.

Though the disorder of the stomach seem'd to be somewhat alleviated by this vomiting; yet the other disagreeable symptoms not only continued, but were even more violent than before. In the morning the physician order'd a vein to be open'd, and some blood to be taken away, and the blood, in the first cup, shew'd a crassamentum that was softer than it naturally is, a thin crust on the upper part, and a milky serum around; but in the second, all these several parts of the blood receded less from their natural state. This and other remedies being made use of, after a few hours, almost as much as before, of the fluid I have describ'd, was thrown up by vomiting: and the same thing happen'd again, and again, a little time after; so that the whole of the quantity, which was thrown up in this manner, on that day, was equal to about sixteen pints.

The night following, the same symptoms were violent, a tremor of the left arm coming on besides; which had a delirium preceding it, and often recur'd, but particularly while the arm was expos'd to the air: and in the morning, degenerated into a kind of epileptic paroxysm, in which, not only the arm, but the mouth, the eyes, and the left thigh also, were extremely convuls'd. These symptoms lasted for a great number of hours: at length, that arm was seiz'd with a palsy. Nevertheless, the epileptic attacks continu'd to return so frequently, that more than twenty were reckon'd within an hour. In the mean while, the vomitings were also more frequent, by which a matter of a porraceous colour was discharg'd, and in this matter fragments of small membranes, as it were, floated.

Moreover, a singultus, which had begun after the palsy I mentioned, about noon, began now to be much more violent. And, notwithstanding all these symptoms, seem'd to be somewhat more quiet after dinner, yet, when the evening came on, they were again exasperated; so that the pulse, and the strength, being more and more decreas'd, through the whole night, and the patient, being troubl'd with gentle vomitings, at one time, at another time, with the delirium, and singultus, but still more often, with dreadful, though shorter, spasmodic paroxysms, died at the twelfth hour in the morning.

The abdomen was tumid, as the intestines were also. These, and the stomach, on their more anterior surfaces, were ting'd with that same colour, with which I said the fluid had been ting'd, that was thrown up by vomiting. The stomach was internally inflam'd, all the small vessels whatever being very turgid with blood. The gall-bladder, although empty of bile, was nevertheless seen to be very turgid, but this turgidity, was from air.

In the thorax, the right lobe of the lungs adher'd closely to the pleura: and this, and the left, were ting'd with a black colour, and full of an ichorous matter. In the right ventricle of the heart was a slender polypous concretion.

5. The fatal event, which was indicated by the fourth day in this gentleman, was finally brought on, by the seventh. But if before so great an impetus of the disorder had fallen upon the stomach, the physician, whoever he was, suspecting from some discoveries or the former days, what was at hand, had made an early, and proper use of the peruvian bark, he might, perhaps, have been able to prevent the progress of the disorder, and thus have sav'd
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the patient. But these things happen'd, as far as I can gather from this, and the preceding observation, at that time, in which they were as yet afraid of using the peruvian bark, by way of a febrifuge, in the manner that we use it at present, and as it was first made use of at Bologna successfully, a few years after, by that very ingenious physician Dominic Gulielmini, in the case of a gentleman of a noble family, whom the next exacerbation, of a dangerous fever, would otherwise have carry'd off, as it had happen'd to others.

However, from whence the porraceous tincture arose, with which the humour thrown up was colour'd, is shown by the emptiness of the gall-bladder. But other juices were mix'd with the bile, in the stomach, and intestines, before, when the fluid, which was thrown up, had quite a different colour. But with which of these colours those viscera were ting'd, as Valsalva has not made it sufficiently clear in his papers, I was not at liberty expressly to determine, in the history.

6. But now I will give you other histories, which are likewise divided into two kinds, the one relating to vomitings of a long continuance, and the other to those of a short continuance. And of all these, that shall be the first, which produces an example of vomiting, than which not many of longer continuance will be found: and this is the same that I remember to have promis'd you, in particular, when I spoke of the palpitation of the heart (*b*).

7. A noble matron of Padua, who, from her very birth, had often thrown up the milk she suck'd, so that her nurse despair'd of her living; having nevertheless grown up to an age of maturity, was married, and became the mother of many children, and being now in her thirty-fourth year, began, in her lying-in, to be frequently troubl'd with a vomiting, from which, after two months, she believ'd she should be free for the future, as she had thrown up a kind of globular body, more than two inches in diameter, which, at that time, consisted of a pretty soft matter, but, being expos'd to the air, was, after three days, found to be extremely hard.

But the event did not succeed to her wishes. The vomiting continu'd, and notwithstanding it was contend'd with by many physicians, for a long time, sometimes by more mild, and, at other times, by more violent remedies, yet it continued to the very time of her death, that is for four and twenty years together. It return'd every day at two hours after dinner. It did not return after supper till the next day in the morning. And although changes were frequently made in the nature of her aliments, it always return'd in the same manner, and she always threw up a whitish matter, which was thick in its consistence, and ductile. And if the patient endeavour'd to prevent these vomitings, she suffer'd great uneasinesses in the region of the stomach, till they return'd, and the matter was discharg'd; but this did not happen without considerable strainings: however, after vomiting every thing was easy, and quiet.

There was no discharge from the intestines downwards, but by means of purgative medicines: and this could be easily brought about, at any time, without any injury to the patient, by a particular remedy, that is by St.

Fufca's pills, as they call them at Venice, a few of which, being kept on the stomach at night, gently mov'd the Bowels, as they generally do, but scarcely brought off any thing, besides watry discharges. Chocolate also staid on the stomach, and was of use to it. If you examin'd the region of this viscous with your hand, you perceived nothing there that was preternatural, nor yet in the other parts of the belly. To these symptoms that I have related, was added, about two years before her death, an intermission of the pulse. Yet the patient did not cease to perform the accusom'd duties of life, both at home, and abroad; till finding that she was not quite so well, and grown weaker, she was under a necessity of passing the last month of her life in bed. And there, every thing being now nauseous to the stomach, and amongst others, chocolate also, a fever was observ'd, which encreas'd every day in the afternoon, and augmented the nocturnal heat, though it made but little change in the pulse. The pulsation of the arteries was rather large, but according to custom intermittent. As she was extremely costive, she beg'd of her physician, that he would suffer her to take the usual remedy, that is the pills of St. Fufca; by which a very great palpitation of the heart was brought on: and notwithstanding this was alleviated, almost immediately, by taking away a few ounces of blood, from the arm, yet it soon after grew more violent again, and oblig'd the physician to order as many ounces to be taken from the foot, by which it was again diminish'd, yet not to so great a degree, as to suffer her to lie down on the left side afterwards.

There was no crust upon the top of the blood, that was taken away. Some days after, the patient being again costive, a gentle glyster brought on the palpitation. As external remedies were of no use against this disorder, and as but few internal remedies were admitted of, by the circumstances of the patient, who took scarcely any nourishment, and that unwillingly, among which remedies were the distill'd cherry water, and baum water, and a water made from compositions, wherein was a little castor, to which was once added a grain of opium, and there being nothing that either prevented the vomiting, or appeas'd the palpitation, the pulse growing very weak, slender, and creeping, on the last five days of her illness, and the palpitation continuing, stools came on without any means having been us'd to excite them, and that even to excess, so that they were frequent, and in great quantities, but at the same time, however, hard. Wherefore, the other symptoms continuing, and the extreme parts of the body growing cold, this very worthy matron ceas'd to live any longer, I say very worthy, on many accounts, but even for this one instance of her humanity, and virtue, she deserv'd to have enjoy'd a much longer life; I mean because she gave orders, in her last moments; which very few women have the virtue and resolution, to do; that her body should be open'd, in order to find out the cause of her obstinate, and long-continued vomitings, that if it should chance to be found out, it might be of some advantage to her children, against an hereditary disease; for she had a daughter, who already began to be affected with the same disorder, and her mother, who had been dead many years, had also labour'd under the same symptoms of vomiting. Being therefore desir'd in the name of the noble family, by my most respectable colleague Vallisneri the younger, to be present at the dissection, and having heard all the relation that I have given you, from

that very eminent physician Peter de Marchettis, grandson of Peter the Chevalier, who had attended this matron, for the last twelve years of her life, and treated her with the mildest methods of cure, as it was proper, in her disease, that he should; I took care, in presence of him, and other physicians, among whom was the celebrated Dominic Militia, formerly my auditor, that the dissection should be accurately perform'd, on the evening of the same day, on which the patient had died in the morning, that is on the eighth of April, in the year 1744.

The body was emaciated, but not to any great degree, and had no cedematous tumour of the limbs. The belly contain'd a considerable quantity of yellowish water: the omentum was furnished with but little fat, yet cover'd a great part of the intestines, and was connected to the peritoneum, on the left side: the stomach was contracted, and where it began to approach to the antrum pylori, it was still more contracted, so as to be, in some measure, divided into two cavities, as it were; however, in the thickness, and colour, of its parietes, if you examin'd it externally, it was natural; but on the inside, of a red colour, as if from inflammation. In the stomach were contained a part of the water, or broth, that had been last taken, and some pretty thick portions of that viscid matter, which was wont to be thrown up by vomiting. In the pylorus itself, and the duodenum, there was no morbid appearance, besides the colour of the internal surface, which was similar to that I have mention'd in the stomach.

The pancreas, which was, in other respects, of a proper magnitude, was so white, in every part of it, and when I order'd it to be cut into, consisted of lobules, so distinct, and so destitute of moisture, that if they had been a little harder, for they were pretty hard, I should not only have pronounc'd, that the pancreas was of a scirrhus nature, but that it was, already, quite converted into a scirrhus. The spleen, and the liver, were internally found, although the former, on its whole external surface, and the latter, on its inferior surface, on the right side, were pale. But the gall-bladder had all its parietes so much thicken'd, that I never remember to have seen the like: for which reason, notwithstanding it was full of bile, inasmuch as it was in a person, who, for so many days together, had taken very little nourishment, and notwithstanding this bile was so black, as to have ting'd the interior surface of the gall-bladder with a black colour; yet the external surface of it was white. For the same reason that I hinted at just now, in the contraction of the stomach, the intestines, and particularly the small ones, were contracted also, to a very great degree, as even that excessive evacuation, by stool, which had so lately preceded, required. Out of all the intestines, the appendix vermiformis alone, was a little more turgid than usual, and red on the external surface. In the mesentery, and the other parts of the belly, we observ'd nothing that was not natural.

But in the thorax, water was contain'd on both sides, and not in small quantities, nor a little bloody. The lungs, in like manner, though in other respects found, were connected to the sides of the thorax, by many thick, and pretty long inmembranous filaments. The pericardium adher'd, very closely, to all the surface of the heart, to that of the right auricle, and of the large vessels belonging to the heart. Nevertheless, the heart had a proper thickness in its parietes,

parietes, and a proper capacity in its ventricles. Both of these cavities were likewise, full of blood, such as issu'd, in great quantity, from the vena cava, when cut into, black, and in great measure coagulated, and grumous, but without even the least polypous concretion. The valves that are plac'd at the venous orifices of the heart, although they seem'd to be white, were not however indurated. But out of the remaining valves, those that are situated at the beginning of the great artery, had their extreme borders not only much thicken'd, but of a cartilaginous hardness. The artery itself was in a very natural state, both internally, and externally: nor did any other marks of disease appear in the thorax, besides those which I have mention'd. There was no reason for us to go through a dissection of the head.

8. As to the disorders that were found in the pericardium, and the heart, how far they may relate to palpitation, and an intermittent pulse, I have already hinted in several places (*c*). But those which were found in the gall-bladder, and the pancreas, seem to me to have a reference to the vomiting. And perhaps I should think the same, also, of that contraction of the stomach, by which it seem'd to be divided into two cavities, as it were, if I had not describ'd the same structure to you, in two other women (*d*), neither of whom had been subject to a vomiting, nor yet a woman of princely rank, and others besides (*e*), in whom I remember that the stomach had the same appearances.

For it happen'd to me, when I saw this conformation of the stomach, to see it in women, as it did also to Valsalva (*f*): from whence I began to suspect whether these appearances might not be reckon'd among the other disadvantages, that they create to themselves, by compressing the upper part of the belly with hard stays, if I had not observ'd that the same thing happen'd to women of every station, and not only in women, but even in men, as has been observed by Riolanus (*g*), and by the very celebrated authors, Heister (*h*), and Fantonus (*i*). And not one of those observers, nor yet the celebrated Petschius (*k*), and Amyandus (*l*), who have seen it in women, have ever mention'd a word of vomiting, in these men, or women, though they might have mention'd it, and indeed some of them ought, in justice, to have mention'd it, if any thing of this kind had been observ'd.

And though you will find, in this eighth section of the Sepulchretum, an observation of Blasius (*m*), who met with the stomach double, in a man who had been long troubl'd with very frequent vomitings, you nevertheless will see, that he did not ascribe the vomitings to this double state, but to the great narrowness of the foramen, whereby one stomach communicated with the other: which kind of narrowness never was found, in those that I have observ'd. But if you read this observation in Blasius (*n*), you will find it to be join'd with another of the same kind, in which, although there was, not only a great narrowness betwixt the two stomachs, but “ a very great and

(*c*) Epist. 23. n. 21 & 23 & alibi.

(*d*) Epist. 16. n. 38 & epist. 26. n. 31.

(*e*) Epist. 37. n. 28.

(*f*) Epist. 36. n. 2.

(*g*) Anthropogr. l. 2. c. 20.

(*h*) Diff. sist. obs. med. miscell. obs. 6.

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(*i*) De observ. med. & anat. epist. 3.

(*k*) Syllog. anat. obs. §. 84.

(*l*) Vid. commerc. litter. a. 1734. hebd. 25.

in fin.

(*m*) N. 26.

(*n*) P. 4. obs. méd. 9.

“excessive straightness,” the man was nevertheless, except his being very hungry, “in very good health,” and consequently not subject to vomitings.

Yet if you would choose to suppose, that this structure of the stomach, in the matron whose history I have now given you, had also contributed something to the production of the vomitings, inasmuch as it had, without doubt, existed from the first formation of the stomach, join’d with that deprav’d disposition of the gall-bladder, and the pancreas, which becoming more evident, as the patient encreas’d in years, brought on an incurable vomiting; I shall not violently contest the opinion with you. And there is not the least doubt, but so great a thickness in the coats of the gall-bladder, render’d it less obsequious to the pressure of the stomach, and the first intestines, so that, probably, a sufficient quantity of bile was not press’d out from thence, and this bile was likewise vitiated.

And as the pancreas was without any moisture, and inclining to the nature of a scirrhus, you may easily imagine, how much less juice it must, of course, secrete, and how much less fit that juice must be for the purposes to which it was intended, and you may, at the same time, gather, how imperfect an elaboration of the chyle there must have been, from the defect of both these humours, and the disorder in the duodenum, and how much gross, and viscid, matter must, consequently, stagnate there, which would irritate the coats of that intestine, in such a manner, and particularly in the motions, and agitations, of the body by day, as at length, to stir them up to an inverted motion. And if to these you are allow’d to add that peculiar structure of the stomach, which was, perhaps, not quite so proper to prepare, and act upon, the aliments, or at least to thrust them on, with sufficient dispatch, into that intestine, it will be so much the more easy to conceive the causes of this very obstinate, and long-continu’d, vomiting.

9. But to speak of one of these causes only, for the sake of brevity, that is, of the diseas’d state of the pancreas, you will see here in the Sepulchretum, besides the fifty-third observation, and those that follow, others, also, that are pointed out, and that not only above, but in particular below, under numbers fifty-seven (o), and fifty-eight (p), and other numbers; and you will find that a vomiting was join’d with the disorders of the pancreas. It is true, I am not among the number of those, who have suppos’d, that I know not what diseases, and even vomitings of blood, are to be accounted for, from “the pancreas alone” (q): and I even confess, that this viscus has been found to be diseas’d by me, and by others, without a vomiting being the consequence of it. Yet I cannot deny, that disorders of the pancreas have been seen, by me, to be join’d with vomitings, and that I have heard from others of the same thing having been seen, frequently, by them also.

But I shall have a more convenient opportunity to give my observations hereafter. At present I shall take notice of some observations from others. And in the first place, I heard from a follower of Malpighi, who was, when living, a learned physician at Bologna, and my preceptor, I mean Jacob Sandri, that he had made remarks upon many dissections of persons who had

(o) §. 5. 7.

I.

(p) §. 2. 4.

(q) Vid. *ibid.* obs. 74. in fin.

been.

been subject to vomitings, and particularly of a humour resembling tobacco in its colour; and that in all these bodies the pancreas had been in a diseas'd state. And Heraclito Manfredi; he whose praises I have already, with justice, proclaim'd; when I return'd to Bologna from Forli, the place of my nativity, where I had retir'd for some months, which I think was in the year 1704, related to me an observation of his: which I will here communicate to you; and that, rather, because it relates to the discourse which I have begun upon the pancreas, than to the order which I promis'd to observe.

10. A robust man, without any manifest preceding cause, was troubl'd with a continual endeavour to vomit, yet besides his medicines, and his food, none of which he could retain, he vomited but little at a time, and seldom, and what he did bring up was watery, and for the most part bitter. Besides this, he was troubl'd with a great thirst, with a kind of frequent swoonings, and, in particular, with a pain, just as if he were torn to pieces by dogs, at the common boundaries of the thorax and belly: which, if you examin'd it with the hand, had not the least hardness, or resistance, whatever. With these symptoms, and with a low pulse, he died within the eleventh day.

The belly being open'd, the liver appear'd to be very large, but sound. The intestines, likewise, and the stomach, were sound. And the mesentery, also, though not without some obstruction. But the pancreas was larger than its natural size, and universally unequal, with roundish tubercles of a considerable magnitude, and was itself almost of a cartilaginous hardness. In the thorax was much water, and in the pericardium, a very large quantity, like to that in which fresh meat has been wash'd. The heart was very small: and in its right auricle was something of a whitish polypous concretion.

11. The reason that tumours of the pancreas, unless they themselves are perhaps large, and the patient very much emaciated, are seldom perceiv'd by the touch externally, or, at least, not without difficulty, arises from the remote situation of the viscus, and from the interposition of whatever may lie betwixt that, and the hand, and especially from the stomach being turgid with flatus, or from the liver, as in this man, being much enlarg'd in its size. And as, in case of this difficulty, Riverius has hinted what signs we may make use of^(r), so he has not omitted, in the number of these, such as are to be taken from the pain of the neighbouring stomach, and from other symptoms. However, the pancreas may excite a vomiting, in many different ways, as when it irritates the contiguous stomach, which is of a peculiarly exquisite sense, by its hardness, and roughness, or, by an increas'd magnitude, prevents it from being sufficiently dilated.

For the discharge of all the ingesta, by vomiting, is the natural consequence of the impeded dilatation of the stomach, whether this viscus be the cause of the obstruction to its own dilatation, by reason of its coats becoming much thicken'd, and scirrhus, as in the observations of those celebrated authors, Laubius^(s), and Haller^(t); or whether, for the thing comes just to the same, there are other obstacles oppos'd to the dilatation thereof, as, for instance, large steatomatous tumours, which Verdriesius^(u) saw lying

(r) Prax. med. l. 13. c. 4.

(s) Eph. n. c. cent. 7. obs. 41.

(t) Opusc. pathol. obs. 21.

(u) Eph. cit. cent. 6. obs. 16.

near the stomach, or that large body, which, as you will read in the very excellent Heister (x), was likewise found in the same situation, in two women. And that the viscera themselves, which are contiguous to the stomach, may also be obstacles to its dilatation, if they are immoderately swell'd and hard, was prov'd some years ago, by the untimely death of a most learned archiater, who was my worthy friend, and whose incurable vomiting I heard was owing to the liver, and the pancreas, which, by their bulk and hardness, compress'd the stomach, that lay betwixt them.

But the pancreas; to go on to speak of that in particular, especially as it is so easy to transfer those things that are said of this viscus, to the liver also; the pancreas, I say, may excite vomiting, even when it secretes a juice, which, either by its acrimony, is troublesome to the duodenum, or by its inactivity, or any other defect whatever, is the cause of a bad concoction of the aliments, and consequently, of some gross parts thereof being left behind, to create uneasinesses in that intestine; or finally, when by the smallness of its quantity, it is unequal to the other uses, and among these, to that by which it moderates the force of the bile, that flows in with it, particularly when the bile is more acrid than usual, and prevents it from stimulating the coats of that intestine, too strongly, and inverting their motion: on which subject you may, also, consult Frederic Hoffmann (y), who supposes, this to have been the very reason, why the bile, and the pancreatic juice, are wont to go to that intestine, by one and the same orifice, and why the dogs of Brunnerus, when the pancreas was taken away, died of bilious vomitings. Therefore when the human pancreas is reduc'd to such a state as to secrete no juice at all, you see very clearly how much more easily those things that I have said may be the consequence. But a vomiting may be also brought on in a different manner by the pancreas, that is, if by its roughness, hardness, or encreas'd magnitude, it irritates, or presses upon, the intestine we have been speaking of (to which it is fix'd by its broader extremity) in the same manner as I have suppos'd of the stomach.

According to these positions, or others of this kind, you may, at your leisure, explain all, or the greater part of all, the histories that relate to this subject, and much more those which have a disorder of the pancreas, and the duodenum, join'd together at the same time, as this that I shall immediately subjoin, which was taken by that very experienc'd dissector, our Mediavia, about the beginning of October, in the year 1733, and communicated to me at the very same time.

12. A monk, who was noble both in his birth, and his manners, and one of the holy family of the capuchins, as they are commonly call'd, was carry'd off by a complication of disorders, but particularly by a dropsy, and a vomiting, when he was in the thirty-third year of his age.

There was some water under the skin of the carcase universally; for which reason the feet, also, were somewhat oedematous. But the belly was not greatly swell'd, nor had it any greater quantity of water, within its cavity, than about two pints. The liver and the spleen were larger than they naturally are, and the former of these viscera was whitish besides, and hard, and its lobules con-

(x) Epist. de pilis, ossib. p. n.

(y) Diff. de pancreat. morb. §. 4.

spicuous.

spicuous. In the stomach was nothing worthy of remark, if you except a plexus of two inches in breadth, and four inches in length, made up of crowded glands, less indeed than a lentil, but furnish'd with an evident orifice: that plexus was in the bottom of the stomach, near the antrum pylori. At the distance of an inch below the pylorus, the duodenum was black, and a little below that, was scirrhus. The pancreas also was pretty hard.

In both the cavities of the thorax, was a considerable quantity of water. The lungs were contracted. The heart was not without polypous concretions: and one of its valves not without a bony portion. But on the internal surface of the great artery, from the superior branches quite to the emulgents, were beginnings of future ossification. This artery, though in a body of a tall stature, was scarcely thicker than a finger of a moderate size: and the other sanguiferous vessels, also, were narrow in the same proportion.

13. As this great narrowness of the vessels, and particularly in a body of this kind, had probably been the beginning of all its diseases, so I do not doubt, but that the hardness of the pancreas, and still more of the duodenum, had been the cause of the vomitings. For whether that intestine is streighten'd by compression, as was formerly observ'd by Riolanus, whom you will see quoted here in the Sepulchretum (z), or whether, by reason of its coats being scirrhus, it is not able to constrict itself, the same effect follows, notwithstanding the causes are so opposite, that is the ingesta, which were about to be carry'd out of the stomach, as they are receiv'd into the intestine with less ease, or propell'd forwards with more difficulty, remain, the greatest part of them, in the stomach, and being there corrupted, or heavy, by the very delay itself, grow troublesome to the stomach, and bring on a vomiting, a very clear example of which has been even produc'd by the celebrated Molinelli (a).

The same thing must happen, when the pylorus is affected with disorders of the same kind. And you have, here, many examples in the Sepulchretum, as in the eleventh and seventeenth observations, and the greater part of those that follow, almost quite to the twenty-sixth, and again in the fifty-sixth, article the thirteenth, and in the additamenta, observations the first and eighth; and indeed in other places, as in book the first, section the ninth, and not only in the thirty-fourth observation, but, moreover, if you attend to those *subversions*, in the thirty-third. And among these that you will read in this eighth section, when you come to the twenty-first observation, which is not far unlike another from Johannes Bohnius (b), and find in that a vomiting of all the food, which was taken in, and death itself at length brought on, within ten days, by the pylorus being stop'd up, from a small piece of silver coin, which the patient had swallow'd down; it will, without doubt, make you call to mind that piece of silver coin, which was of a much larger size, and which the experienc'd surgeon du Luc (c) happily dislodg'd from thence, and even carry'd quite out of the body, not only by the help of other remedies, but, particularly, by the weight of quicksilver, urging it

(z) Schol. ad obs. 23.

(b) Eph. n. c. cent. 3. & 4. obs. 121. in

(a) Comment. de bonom. sc. acad. t. 2. p. 1. schol. inter medica obs. 1.

(c) Hist. de l'acad. r. des. sc. a. 1740. obs. anat. 4.

down, and by means of this last-mention'd metal *amalgamating*, as the phrase is among chymists, with the silver, whereby its size was diminish'd, notwithstanding slight pains, at the pylorus, had already begun to appear, together with an inclination to vomit.

But not to digress too far from these obstructions of the pylorus, which are produc'd by disease, and not by accident, besides those observations which I have pointed out in the Sepulchretum, there are others, and those not few in number, which you may add thereto, as those, for instance, that are extant in the volumes of the Cæsarean academy (*d*), in the Acta Eruditorum Lipsiensia (*e*), in the commercium Litterarium (*f*), and any others besides, amongst the great number taken notice of by the very learned Trillerus (*g*). Out of all these observations, you will find some which, at the same time, confirm those things, that I hinted just now, when I spoke of the pancreas, and the duodenum, and some that even refer to the letters, which I have lately sent you. Of this kind are two even of the celebrated Fantonus (*h*), that ought by no means to be pass'd over here.

Nor, finally, am I wanting in observations of this kind, although they are not so extraordinary as the second of his is: one of these I have already given you, in the preceding letter (*i*), and for that reason shall not repeat it here: but another, which I made on the bishop of Brescia, I defer till I give you those that relate to tumours of the belly (*k*): and a third, that was communicated to me by Marianus, whom I have elsewhere commended, in which calculi, and callus, so closely shut up the pylorus, that it could not be pervaded, even by mercury, I shall send to you when I have receiv'd the whole of it. There is one observation, which may be produc'd here, without any great impropriety: it was taken at Bologna, in the year 1703, about the beginning of December, and I purposely preserv'd it for the present occasion, notwithstanding it agreed, in part, with another subject also, as you will perceive by the obscurity of the pulse, join'd with the greatest laxity of the fibres of the heart.

14. A priest of the famous order of St. Austin, whose name was far from being obscure, among the number of sacred orators, being somewhat more than forty years of age, began, after close studies, journeys, and other fatigues, to perceive a kind of tension, at the right hypochondrium, and this some months before any other symptom discover'd itself. At length a frequent vomiting came on, four hours after taking food. And other symptoms were of course added. Finally, in the last months of his illness, the case was as follows.

In the belly was great hardness, and in the right hypochondrium very great hardness; but no pain if you press'd upon these parts, whereas, on the contrary, a spontaneous pain arose in the other hypochondrium, and that very violent indeed, at the time the food was about to be digested. A humour was sometimes thrown up, which was ting'd with the colour of tobacco, as

(*d*) Cent. 7. obs. 87. & cent. 8. obs. 20. & cent. 10. obs. 10. & act. t. 4. obs. 107. & 135. & t. 6. obs. 151.

(*e*) A. 1711. m. sept. ex Dionis differt.

(*f*) A. 1743. Hebd. 16. n. 2. cum Hebd. 17. n. 2.

(*g*) Differt. de fame lethali, &c. §. 29.

(*h*) De obs. med. & anat. Epist. 2. & 3.

(*i*) N. 6.

(*k*) Epist. 39. n. 21. & seq.

it were, but the discharg'd fluid was, at other times, much more brown, and black, and sometimes, again, of a various colour, and in the greatest part of it, different from these: and some persons did not even scruple to say, that they had not only seen mucous concretions, in this ejected humour, but even that they had observ'd pieces of real membranes, as it were, swimming therein. These gentlemen, therefore, thought that the patient ought not hastily to give up the use of turpentine resin, as it was the only remedy that the stomach would retain, when all others were thrown up. But pills of aloes, gum ammoniacum, and vitriolated tartar, as it is call'd, which another physician had propos'd, they disapprov'd; though the patient himself, conceiving great hope from the effect of stools, as most patients do, eagerly desir'd them. These pills, therefore, being taken, very great vomitings were the consequence of them, and from that time every thing began to grow worse and worse. For the pulse which had been before obscure, was now extremely so, and there was a fever like unto a lypyria: and the urine was such as it is in a jaundice. Within a few days, therefore, the feet being somewhat affected with an œdematous swelling, and the pulse being quite gone, the patient reach'd the close of life, without any considerable difficulty of breathing, or any perturbation of mind.

When the abdomen was open'd, the liver was found to be exceedingly large, full of steatomata, and of a substance lying betwixt them, which resembled the thymus when boil'd, white, lobular, and hard. In the gall-bladder, together with a livid bile, were nine calculi, of different forms from each other, every one of which, at first, inclin'd to a green colour, but, after being dried, became yellow. The spleen was very small, so as scarcely to exceed the size of that silver coin, which we call a crown. The pancreas was so extenuated that it seem'd at first to be wanting. The stomach was, internally, distinguish'd with black spots: in other places it was flaccid, but in the pylorus it was callous, so that it could not yield properly, and be sufficiently dilated.

The viscera of the thorax were, also, flaccid and lax; so that the flesh of the heart could easily be drawn into pieces, by the hand. Besides these appearances nothing morbid was observ'd; so that there was no extravasation of any kind of moisture, either in the thorax, or belly.

15. Whether the spleen happen'd to be very small, in this priest, from the original formation, as is perhaps the most probable, or whether the course of the blood being diverted by the hepatic artery, from the splenic, into the enlarg'd liver, caus'd an extenuation of the spleen, and of the pancreas, at the same time, or finally, whether the bulk of the liver being increas'd more and more, together with its weight, and hardness, brought on this extenuation; you plainly see, that neither the liver could have sufficient assistance from such a kind of spleen, for the secretion of the bile, nor the duodenum a sufficient quantity of juice, to temper the bile, from such a kind of pancreas. The nature of the bile, therefore, being chang'd, for this reason, but still more on account of the disorders of the liver, which even the colour of it, and the calculi that had form'd themselves in the bladder, demonstrat-ed, consequently, the chile, and the blood, being chang'd, and the humours that are secreted from it, not only in other places, but particularly in the stomach,

stomach, the intestines, and the pancreas, it is by no means difficult, clearly to understand the origin of those things that happen'd to this patient, but especially of this very great variety of colours, which appear'd in the matter that was thrown up. For it is not surprizing, if preternatural colours arise from humours, which recede much from the ordinary appearances of nature; nor yet, if from the various secretion, mixture, and delay, of all and of each of them, in consequence of those diseases, and the strainings to vomit, at one time these colours, and at another time those, more particularly, arise. It is rather surprizing, if at any time, in those who have shown no mark of deprav'd secretions of this kind, a vomiting be suddenly brought on, of any juice ting'd with such a colour, as you would by no means expect. An observation of this kind, is that which was communicated to me by letter, in the year 1718, from the same person, whom I mention'd above (*l*), I mean the very learned Manfredi. This observation, however, relates to vomitings of short continuance, as you will immediately see.

16. A man, who was by trade a smith, went out from home in the morning, with a very slight pain of his stomach. Which growing very violent soon afterwards, the patient began to throw up a humour extremely similar to ink, and before evening he died.

The stomach contain'd two pints of a humour equally black, inodorous, and grumous. The internal surface of the duodenum was, almost universally, and the stomach, universally, ting'd with the same colour. The external coat of the stomach, also, on that part where it is turn'd towards the diaphragm, had a very black spot, of four inches in extent, every way: and it was surprizing, that the intermediate coats were no where ting'd with any other colour but that of tobacco, even in the parts thereof, that lay under this black spot, so that there they themselves were not black, notwithstanding they were intercepted, on both sides, with a very black colour.

17. This spot was perhaps of a gangrenous nature. And the only thing that prevents me from believing the internal blackness of the stomach, and the duodenum, to have proceeded from the same cause, is that humour, so exceedingly similar to ink, which was found in the stomach, and in part had been thrown up, and which was, of itself, sufficient to tinge these viscera, in that manner. And if you imagine this humour to be *atra bilis*, you will be the less surpriz'd at the patient's death, when you call to mind the aphorism of Hippocrates (*m*), who foretells death to any person whatever, who, to make use of the translation of Celsus (*n*), "has a discharge of *atra bilis*, in a recent disease, either by vomiting, or stool."

But from whence could this very great blackness arise? could it be from the bile, which was of itself very black, being extravasated into that intestine? For you may see in the observations of the celebrated Budæus (*o*), and Schöberus (*p*), that the gall-bladder was very large, and turgid with the same blackish matter, which the patients had thrown up by vomiting. Was the bile which had grown already blackish, made so much the more black, by

(*l*) N. 9.

(*m*) 22. f. 4.

(*n*) De medic. l. 2. c. 6.

(*o*) Eph. n. c. cent. 1. & 2. obs. 105.

(*p*) Earund. cent. 3. & 4. in append. n. 12. c. 1.

some other humours being mix'd with it, in that intestine? Or was something black also, added to it by the blood, which flow'd out from the small vessels, that were eroded during the very violent pain? Take care how you suppose all this humour to have been blood. For a blunder of this kind could not possibly happen, to so accurate, and experienc'd, an observer: nor, indeed, was the quantity of the humour discharg'd, if we suppose it to have been blood, sufficient to have destroy'd the patient, in so short a space of time. And even Hoffmann himself (*q*), describing a young man who died with black vomitings, and stools, notwithstanding it appear'd in the stomach, that many sanguiferous vessels were ruptur'd, did not, nevertheless, account for his death from the effusion of blood, which does not destroy so suddenly, even when greater, but from the putrefaction of the blood infecting the brain: and in his patient, death had not follow'd within a few, as in the present case, but within four and twenty hours, and the matter which had been thrown up, and that found in the stomach after death, were both of them, instead of being without any smell, intolerably foetid.

Nor was the matron of Budæus, nor the merchant of Schoberus, notwithstanding the latter was carried off in much less time than the former, snatch'd away by so speedy a fate, as the smith of whom I am speaking, and yet they had vomited up corrupt and foetid matter, and in so great a quantity, that only a little blood remain'd behind in the vessels. But of what nature this blood was while they were living, not only the foregoing symptoms, but the internal gangrenes which were found after death, and other things, clearly shew'd. Yet in regard to such a kind of blood, that either increases, more than others, that black humour, which the ancients called *atra bilis*, or degenerates into it, you may read what two very learn'd Archiaters have written upon the subject, I mean Schoberus whom I have already quoted (*r*), and the illustrious Vanſwieten, who is much more full, and clear, upon this head (*s*).

And you will believe that Hoffmann differs from them only about a name, when you have attentively read the case, and dissection, of the young man I have spoken of, and those of a woman soon after (*t*). For he deduces the black vomitings, of both these patients, and their black stools, from blood indeed, but from that which was putrid, and foetid, and explains the more speedy death of the young man, "in the same manner as he would that, of those who are affected with a sphacelus of the external parts only;" for the spirits of the brain, and of the nerves, being infected by a blood of this kind, "they suddenly lose their strength, and their life." But if there was any other humour in this smith, it was certainly the most pernicious, and of the most destructive properties, by whatever name we may call it, or, rather, it was the result of such a mixture of humours, as may be compar'd with an in-bred poison. For it is not in the power of every black juice to bring on such violent tortures in the stomach, or to snatch off the patient by so precipitate a death: and this you will also learn, from the preceding seventh section of the Sepulchretum, when you read, that after a pain of the stomach,

(*q*) Medic. rat. t. 4. p. 2. f. 1. c. 3. obs. 2.

(*r*) Append. cit. c. 2. §. 5. & 6.

(*s*) Comm. in Boerh. aph. §. 1091. & seq. passim.

(*t*) C. 3. cit. obs. 3.

this cavity was found to be "half full of a black juice (*u*)," or that in the fundus of it was "a matter like ink (*x*)," and other things of the same kind.

18. Mention being made of bloody vomitings, and poison, you will perhaps ask me, why I produce no examples of real blood being discharg'd by vomiting, nor any instances of that which is the consequence of most poisons, that are drunk, or swallow'd; especially as in this eighth section of the Sepulchretum, so many of each kind are produc'd? But to what time I defer considering the effects of poison, I have declar'd near the latter end of my last letter (*y*). And the observations of bloody vomitings, except that which is given in the same letter (*z*), remain to be given in other epistles, and on more proper occasions. And there, perhaps, I shall not scruple, to declare, what we ought to think of the greater part of those observations, which, in this section, deduce the blood, thrown up by vomiting, from the spleen. For those which account for it, as coming from the lungs (*a*), are given with such a confession, at least, as gives you to understand, that they are not suitable to this section: which confession, however, is wanting in that place, where a vomiting of pus is deriv'd from a large vomica of the lungs (*b*). There is, on the contrary, where what was a true vomiting, as similar stools, about the same time, demonstrated, I mean of blood, mix'd "with pieces of flesh," or in other words, with polypous concretions, is accounted for, as coming, by divine permission, "from the heart, through the lungs, and the aspera arteria (*c*)!" and for what reason? why because the heart was found to be "fill'd with the same kind of matter," as was thrown up by vomiting.

Nor do I imagine you will expect from me, in this letter, those observations, which, notwithstanding they have a vomiting attending upon them, properly belong, either to the iliac passion, and those hernias that are call'd incarcerated, or to wounds of other parts, and in particular, of the stomach itself, or to other disorders of some of the viscera, with which the stomach consents. For I do not doubt but you clearly understand, to what occasions all the observations of this kind ought to be defer'd: and indeed you will observe, that most of the observations of this kind, are produc'd in such a manner, in this section, that we are expressly refer'd to other sections, where they are copied more at large. But besides a pretty great number of these, others may also be added, that are set down twice over in this section: and this you will perceive, by comparing the twenty-ninth observation, with article the fifth of the fifty-ninth, the thirty-eighth, with the forty-third, article the first, and the fifty-seventh, article the ninth, with the sixth of those you read in the additamenta, and perhaps others; and you may suppose the same thing to have been said of the scholia, in which observations are repeated, as those that are subjoin'd to the first, and the third, will show, if compar'd with the scholia added to the thirteenth, and, in like manner, to the fifth; and perhaps the same may be remark'd of others.

(*u*) Obf. 23.

(*x*) Obf. 26. §. 1.

(*y*) N. 21.

(*z*) N. 12.

(*a*) Obf. 75. §. 1. & 2.

(*b*) Obf. 65.

(*c*) In additam. obf. 10.

19. When I read over that first observation, which I just now mention'd, and those things which are upon the subject of throwing up polypous formations by vomiting, and on the subject of vomiting, in consequence of distases of the parts that consent with the stomach; some things were brought back to my mind which, if I add them here, you will perhaps not read with reluctance. Willis then, in this observation, affirms that "if a constant suffusion of bile happen, in the parts that are near to, or in contact with the stomach," a frequent "vomiting is excited," because the external coat of this viscus is, for that reason, frequently, and greatly, irritated, and that "he had observ'd this in many who were dissected after death." And I not only believe that this may have been seen by that very excellent man, but even confess, that there may be sometimes such an acrimony of the bile, and such a power of irritating, and penetrating, as to make it the accidental cause of vomitings, especially in those persons, who are endow'd with a very exquisite sense; and if the tincture of the bile extends itself very far, and reaches to the interior parts of the stomach: which Platerus, as you have it in the preceding seventh section, of the Sepulchretum (*d*), has particularly observ'd in those "who, when living, were troubled with continual heats of the stomach."

Yet there is more than one reason which has some influence in preventing my assent. For in the first place, I doubt, whether the particles of the bile that tinge the parts which lie round the gall-bladder, escape from thence while the person is living, or only after death, where the resistance of the coats is lessen'd, and the interstices which lie betwixt fibre and fibre, are relax'd. And in the next place, I have so frequently seen the neighbouring parts of the gall-bladder have a yellow hue in dead bodies, as I have likewise said in the preceding letter (*e*), that it does not seem to be the cause of any peculiar injuries to some persons, but the cause of those which are common to most persons while living. Finally, unless it be certain; and it is by no means certain; that when these gentlemen have ascrib'd such a tincture in that place, there was nothing else in the bodies, to which either the sense of heat, or the vomitings, might be imputed; there is a very great propriety in doubting, whether these effects are to be ascrib'd to that cause. An instance of this kind, which confirms the propriety of doubting, I will give you in a little whelp that I dissected, when I was a young man at Bologna. For it is much to our present purpose, and I see that observations taken from dogs, are not only produc'd in other parts of the Sepulchretum, and that frequently, but particularly in this very section (*f*).

20. A young whelp died suddenly after great vomitings. The antrum pylori, where it was contiguous to the gall-bladder, I found to be ting'd with a yellow colour, which had reach'd from the outer coats, quite to the inner; it stop'd, however, at the internal coat, so that the matter which was contain'd in the stomach, resembl'd even the white of an egg, in its colour. While I was enquiring whether there was any thing else which deserv'd remark, I saw that a part of the centrum tendineum of the diaphragm, was likewise yellow, which being very thin, and particularly, in that tender age,

(*d*) Obs. 16.(*e*) N. 13.(*f*) Obs. 68.

had transmitted this yellowness into the cavity of the thorax, in such a manner that some small contiguous part of it was yellow, though but slightly.

All the parts being now inspected, and found to be quite sound, it came into my mind to lay open the intestines, by cutting into them longitudinally. In their cavities was a great quantity of mucus, and in that mucus, near to the more extreme part of the small intestines, were ten round worms, all of them nearly of equal thickness, and of equal length also; and this length was about seven inches.

21. Would you rather choose then, to attribute those irritations, which, by vellicating, and convulsing the fibres, had brought on such violent vomitings, and, at length, sudden death, to this yellow tincture, although it had not only infected the stomach, but a tendon of that nature also, or to so great a number of worms of such a kind, whether they had crept into the stomach, or had continu'd where they were? You will hesitate at least, and will not affirm the first position for a certainty.

But you would hesitate still more, to go on to the second, if you should chance to believe, what is related in the additamenta, to this section (g), of the servant-maid of Altemburg, who discharg'd lizards, toads, and frogs, and sometimes even those that were not dead neither, but such as liv'd, by the special licence of heaven, "to the sixth day," from the mouth, and anus, and even, as she herself said, from the genital parts! It happens very luckily, that the learned gentlemen who have first written such absurdities, do not say that they were present, when these living beasts were discharg'd; lest we should be under a necessity of concluding, contrary to our candid inclinations, that their eyes were deceiv'd, and play'd tricks with, by a set of juggling women. For I should suppose that, in fact, there was nothing real in the things of this kind, which the woman did discharge, but a sort of external, and accidental, likeness to those animals: and that the body, and consistence, of them, had been made up of polypous concretions, ting'd with the green colour of the bile.

It happen'd many years ago, that a virgin who was, herself, very virtuous, and honest, and born of honest parents, began, at the latter end of lent, to complain of a kind of troublesome sense of torture, and weight, with which the stomach was affected, and particularly at the time when digestion was going on. After this came on a pallid complexion, and an evident wasting of body. At length, about the end of two months, from the beginning of her complaints, she was seiz'd, a little before the middle of the day, with three very violent strainings to vomit, join'd with the greatest loss of strength, and a fainting; in the first of which strainings, she brought up nothing at all, in the second not a great quantity of a very bitter, and yellowish humour, and in the third, at which time the physician, who gave me this account, by letter, was present, she threw up a substance, which I shall describe to you, exactly in the same manner, that it was describ'd to me, by this physician.

It was a small plant, or rather a little herb, about an inch long, furnish'd with radicles, a stalk, and three leaves at top, one of which was denticulated, the others perfectly resembling a semicircle, and all of them being green.

The stalk, on its upper part, was white, and, on its lower part, green, except that it was distinguish'd with some very small, and bloody striæ. After three or four hours, the herb being now dry, had contracted itself, yet still retain'd its colour. Being accurately examin'd by many persons, and among these by some, who were skill'd in botany, before it was wasted away by frequent handling, and become almost friable: there was not one, among them all, who could say of what genus it was. The virgin, however, after the discharge of this substance, felt not the least uneasiness in her stomach; and indeed evidently recover'd her colour, and her flesh, when this account was sent to me, by letter, which was not many days after. It was enquir'd of me what I thought of so strange, and unheard of, a kind of vomiting. There was not any reason for me to imagine the same thing to have happen'd, in this case, that happen'd in the observations of some persons, as for instance, of Lentilius (*b*), who says that he had seen "lettices thrown up by vomiting, with the flowers of the Indian crests, borragé, and roses, little, or not at all, chang'd in their colour, which a woman of the first rank, had eaten fourteen days before."

For to take no notice of other things, this virgin could not endure to eat herbs, sallads, or succulent plants of any kind. One or the other, then, of these things remain'd certain, that she had either thrown up an excrescence in the form of a herb, or a polypus, from her stomach. And the preceding disagreeable symptoms, the vast strainings to vomit, the bloody striæ, observ'd on the body that was thrown up, and the whiteness of its colour; for whatever there was of greeness, that might have been brought on by the bile being mix'd with acid juices; all these things, I say, seem'd to confirm one or the other of these conjectures: but which it would be the best to follow, I thought would be best determin'd by the ensuing circumstances of the case, that is by there being new uneasinesses of the stomach, or none at all, or what not. And this is a summary of the answer, which I immediately return'd to the physician, who consulted me thereon: nor did I afterwards hear any thing farther of this virgin.

22. What I shall add, in the last place, of vomitings that relate to the diseases of those parts, with which the stomach consents, will perhaps be more useful to you. For that which prevents me from putting off the consideration of these vomitings, till we come to the disorders of those parts, as I have done in regard to other vomitings, is that I have no diffidence to give you under this head. There was a colleague of mine, a very considerable man, the grandson of a celebrated writer, and himself also worthy of great praise: who, when he was sixty years of age, began to be attack'd with frequent and very troublesome vomitings, though they sometimes were quite at rest for a day. What he threw up had nothing particular in it. He was attended, out of regard to the dignity of the patient, by three physicians, who were thought to be the most skilful, at that time, and without doubt were so, or at least they were the oldest. As they did not doubt but the cause of the disorder was in the stomach, they applied such things as they thought proper to remove it, and these in great number, and variety, and for a long time to-

(*b*) Vid. append. ad a. 1. dec. 3. eph. n. c. in parall. ad obs. 92.

gether ; but every thing was in vain ; till at length the patient becoming more emaciated, and tir'd out with the slavery of taking medicines, determin'd, with himself, to have done with them all, and retire into the country ; whence having return'd again into the city, not long after, he was seiz'd in the evening, with a great coldness over his whole body, without any manifest cause, and on that very night discharg'd a great quantity of blood, with his urine. Soon after a great quantity of pus follow'd the blood, through the same passages. Wherefore bloody, and purulent, urines succeeding each other alternately, his strength was soon pull'd down, and within a very few days he clos'd the period of life.

From this event of the disease, it is natural, and easy, to perceive, that the cause of the vomiting was not in the stomach, but in those parts that serve for the secretion of the urine, and particularly in the kidneys, inasmuch as they are wont, so easily, to draw the stomach into consent, and excite it to vomitings. And, at the same time, it is understood, what was indicated, not by the stupors of the legs indeed, but by the pains, however, of which the patient had been accusom'd to complain very much even from the very beginning of the disease ; what was indicated by the unusual stimulus to make water, so that he could scarcely retain his urine, till he got the chamber-pot into his hand, and frequently, indeed, not at all, but especially in the night ; and, finally, you will perceive what conclusion might have been drawn, from a kind of hardness about the right epiploic region, as Glisson (*i*) call'd it, without doubt, these symptoms taken all together, notwithstanding the patient did not generally complain of his loins, might have given some hint to the physicians, particularly in conjunction with the inutility of every method of cure, which had been applied to the stomach, that the cause of vomiting was inherent elsewhere, than in the stomach ; and that in the kidneys, and particularly in the right, that some collection of morbid matter was probably made.

To this suspicion some weight might have been added, from this enquiry, that I would always have you remember to make, in cases where the causes of a disease are obscure, and uncertain, and obstinately resist a cure, I mean to what disorder the ancestors of the patient had been liable. For by this interrogation, it would have been discover'd, in the present case, that disorders of the kidneys had been very common in this illustrious family. And those things which naturally occur'd to my mind, upon hearing the case of my colleague, and from knowing the preceding symptoms, you will suppose are written, not to accuse any one, especially the dead, which is not the least part of my intention, but only to assist your studies. Farewell.

(i) Traët. de partib. continent. c. 2. n. 10.

LETTER the THIRTY-FIRST,

Treats of Fluxes of the Belly, with or without Blood.

1. **T**HOSE subjects that, in the Sepulchretum anatomicum, are distributed into four sections, “the cholera morbus, fluxes of the belly without blood, dysentery, and præternatural excretions of the belly,” all these, I say, I choose rather, should be comprehended in this one letter. And the reasons of this resolution are these. In the first place, the cholera “may seem to be a disorder common to the stomach, and intestines,” as Celsus rightly says (*a*); for there is a discharge by stool, and a vomiting at the same “time.” And as I have treated of the disorders of the stomach, and am about to treat of the disorders of the intestines, it is impossible but I must have already lit upon this disorder, which is common to both, or must light on it hereafter; so that there is not the least occasion to treat separately of it here, and slightly in particular; for Bonetus himself, who wrote the ninth section upon this subject, scarcely fill’d up three pages, and the greater part of them is taken up by the scholia, that are plac’d between.

You know, besides, that it is my determination to repeat nothing. But he taking quite a different method, was so far from hesitating, whether to make use of the same observations, here also, which he has made use of elsewhere, that even in this very short section, he has given one of them, and has not only interspers’d the twelfth section, with a great number, as well as the two remaining sections, but has even almost wholly made it up of them.

To this you may add, that parts of the scholia are not only repeated in different sections, as that which is given in the tenth (*b*), from de Graaf, is repeated in the twelfth (*c*), but even in one, and the same section; as for instance, when, in the tenth section, what is taken from Willis, and what is taken from Ballonius, and subjoin’d to the seventh observation, are both equally repeated, the former in the appendix that follows the twenty-eighth observation (*d*), and the latter immediately below this very observation. Besides, not to quit the tenth section, there are so many things added upon the transfusion of blood, & *chirurgia infusoria*, as it is call’d, under the sixth observation, that they exceed the whole ninth section.

(*a*) De medic. l. 4. c. 11.

(*b*) Ad obs. 25.

(*c*) Ad obs. 15.

(*d*) §. 2.

Finally, those bloody stools which are the immediate consequences of a wound, inflicted on the stomach, or the liver, certainly do not belong to the class of dysenteries, which is the title prefix'd to the eleventh section. Yet I see that two observations, of this kind, are produc'd, here, under number twenty-five. As I do not permit myself, therefore, to take pattern from any of these improprieties, there cannot be so great a quantity of matter, but it may be very well comprehended in a single letter. Dividing fluxes of the belly then, into those that are without blood, and those that are bloody, I will immediately produce two observations upon the first subject, from the papers of Valsalva.

2. A young man, who, through the whole course of his life, even when he was in the highest health, had frequent occasions of going to stool, having reach'd his twentieth year, was seiz'd with griping tortures of the bowels, attended with frequent bloody stools, that is with a dysentery. After twelve, or fifteen days, this was chang'd into a simple diarrhœa, with stools of a yellow colour, but without gripings: and this seeming to be somewhat mitigated, by the help of remedies; a simple tertian fever came on, which was put a stop to within a month. The diarrhœa still continuing, he was attack'd of a sudden, with an acute fever, which had manifest accessions. His pulse was frequent, quick, soft, small and weak. To these symptoms was added a stupor of the senses, a considerable deafness, and a peculiar kind of swelling of the anterior part of the thorax, on the left side. In this manner, he died about the fourteenth day, from the beginning of the acute disorder, at which time of the disease, what kind of stools the patient had, the attendants did not observe.

The belly, although it seem'd to be not at all swell'd, contain'd, nevertheless, a great quantity of sanious ichor, which issu'd out of the intestines, in many places, where they were perforated to some considerable extent. This tract comprehended the extremity of the ileum, and the nearest part of the colon besides, to the extent of two hands breadth. In that part the intestines were eroded, and ulcerated, and on their internal surface even affected with a gangrene, so that you see they might be easily perforated. Near to this tract some of the glands of the mesentery had grown out into a tumour, wherein was ichor, not unlike that which had burst forth into the cavity of the abdomen; but the very substance of this tumour was soft, and flaccid, and seem'd to incline to corruption. The spleen was three times as large as it naturally is.

The skin, and muscles, of the thorax, where the swelling was, discharg'd a great quantity of serum, when they were cut into, especially at the upper side of the sternum: for from thence, that is from the borders of the pectoral, and subclavian muscles, serum gush'd out, as if from several little rivulets. The lungs, however, were sound. Within the pericardium was a serum, like water in which fresh meat has been wash'd. If you touch'd the heart, you found it to be so lax, and soft, that it seem'd to be not muscular, but membranous. In the ventricles thereof was a fluid blood, and this was so frothy that it resembl'd the lixivium made use of by barbers, when agitated. And all the veins contain'd so great a quantity of air, that although they contain'd but little blood, they were nevertheless extremely

turgid, and in particular one branch of them that belongs to the spleen; for this branch, though it did not seem possible that it should be more dilated, had scarcely any remains of blood in it. Within the cranium was found a little serum: but the brain itself no where shew'd any marks of injury.

3. The great force of putrefaction (to begin from the latter part of the history, and to return to the former part immediately after) in this body, appear'd from the great quantity of air that had been discharg'd, the great laxity of the heart agreed very well with those small, and weak pulsations. I have frequently observ'd the spleen to be enlarg'd, after other fevers, especially when they had appear'd in different forms.

But to omit other things, and come to those, on account of which, in particular, I related this observation to you, at present; you see, in the first place, how much it, at length, cost this young man, to have his belly perpetually lax, that is, not moderately moist; for we are not ignorant of the aphorism of Hippocrates (e); but more moist and lax than it naturally is, and from an improper mode of living easily made still more so. On the lax intestines, therefore, an attack was made by vitiated and redundant humours, so that they were not able to bear up under it. They were first troubled with a dysentery. This left, according to the appearance of the case, the beginnings of ulcerations, which were the less attended to, because the intestines being then already more relax'd, were not so extremely sensible to pain, as they would otherwise have been, and because the sanious ichor was hidden by the yellow flux, which had succeeded to the dysentery.

The flux had succeeded, in consequence of a part of the deprav'd matter, being carry'd back, from the intestines into the blood, after having been vitiated, in the intestines, still more. And this being brought back again into the intestines, together with the bile, and the other juices, whose receptacles, and containing parts, were irritated by the mixture of this humour, the flux was not only kept up, but the erosions were also encreas'd; so that, at last, where these erosions were made, the intestines were not only seiz'd with a gangrene, but corroded, quite through their substance, by the most ill-condition'd ichor. And that this deprav'd matter was carry'd back into the blood, as I said just now, is not so much prov'd by the fevers that follow'd it, as by the tumour of the mysentery, which lay as near as possible to the ulcerated tract of the intestines. For these ill-condition'd ichors being continually taken up, from that tract, and carry'd to the neighbouring glands, by the chyliiferous ducts, at length deprav'd their internal structure, so that the passage of these humours being now obstructed, they evidently stagnated in those glands, and rais'd them up into a tumour.

4. And from hence another cause was added, which encreas'd the flux, I mean the deprav'd ichor stagnating in the intestinal canal, which, before, had been carry'd off, by the passages that were now obstructed. This kind of obstruction, when it takes place in most of these passages, not only encreases fluxes of the belly, but is even the cause of them, and, in particular, of that which they call the cæliac flux: with which take care not to confound the *cæliacus morbus* that is describ'd by Celsus (f). For in this "there

“ is no motion to stool,” but in that, of which I speak, even the chyle itself is discharg’d, mix’d, beyond doubt, with recrementitious matter, so that the stools are render’d almost of a cineritious colour, and not white, as they imagine, who do not attend to this circumstance, that the chyle is not to be found separate from the other useless parts of the aliments, except within its own proper vessels. Nor have they, who assert that they had seen white stools, meant any thing more than stools of a whitish colour, I mean if they are compar’d with the natural excrements, or if they did really mean white, the whiteness was that of a purulent matter, or of a mucus similar to pus, or something else of that kind; as, for instance, if any one, troubled more with a lienteric, than a cæliac disorder, should discharge by stool the milk that he had taken in, unchang’d.

For in the lienteric flux, the aliments are not concocted, and prepar’d, as in the cæliac, whether the juices, by which they ought to be prepar’d, are unfit for performing that office, or the stomach, by too precipitate a motion, throw them out almost as soon as they are taken in, or whether the stomach itself being lax, and there being a total resolution, or, at least, but little constriction of the pylorus, suffers the aliments to slip out without digestion; although there was nothing lienteric in that old man, the orifice of whose pylorus I have describ’d to you, on a former occasion (*g*), notwithstanding it was not only, of itself, much larger than it usually is, but what is still more remarkable, furnish’d with no protuberating ring, in the greater part of its circumference. Nor was there even any thing of a cæliac affection; nevertheless there are many learned men, who suppose that the pylorus is “ too much dilated,” in this disorder. I, however, do not suppose any peculiar cause to be latent in the stomach; but, sometimes, rather in the tube of the intestines, whether, by an accelerated motion, the ingesta are prematurely disturb’d, and carry’d off, before the chyle can be properly extracted from them, or by reason of the motion being languid and slow, that which has been extracted, is impell’d no farther; so that stagnating in the small roots, as it were, of its proper vessels, a farther absorption of chyle is prevented, just as it is prevented from going on, by an obstruction of the mesenteric glands, as I hinted a little above: not to add any thing upon the subject of cicatriz’d ulcerations closing up the mouths of the lacteal vessels; of which circumstance you will find examples in the Sepulchretum (*h*), as you will likewise of the obstruction of those glands, in bodies that, when living, had labour’d under the passio cæliaca.

Observations of the lienteric flux, or of one that was nearly of the same nature, you will have to add to the others, from the volumes of the Cæsarean-academy (*i*), not indeed without obstructions, of these, and of other glands, but, at the same time, with the coats of the stomach being depriv’d of all their strength, and at other times with the parietes of the stomach, and of almost all the intestines, being reduc’d to the thinness of paper.

But let us return from this digression, into which I fell accidentally, and which nevertheless it may not have been altogether useless to have touch’d upon here, to the observations of Valsæva.

(*g*) Epist. 21. n. 15.

(*h*) Sect. hac. 10. Obs. 2. & 4. ac 5.

(*i*) Act. n. c. tom. 2. obs. 65. & cant. 6. obs. 94.

5. An infant, seventeen months old, was seiz'd with a diarrhoea. To this a fever was added, with a cough, and a kind of itching of the gums, and the nostrils, which the child signify'd by a frequent friction, with his fingers, upon those parts. In the mean while the diarrhoea increas'd, and although the stools had, before, been yellow, or green, they now first began to be ting'd with a bloody hue, and, at length, to be chang'd into a black colour, and be attended with a singultus, which was about the seventh day. On the beginning of the ninth day, either spontaneously, or by the force of an astringent kind of remedy being apply'd to the feet, by the advice of an old woman, they were entirely put a stop to. However, seven or eight hours had scarcely pass'd, after this obstruction, but being oppress'd with streightnesses of the præcordia, and agitated with continual anxiety, and tossing of the whole body, he died on the same day.

The intestines being turgid with air, contain'd a small quantity of very black matter, such as had been before discharg'd. In the mesentery were many sacculi adiposi, and notwithstanding more than twenty-four hours had now pass'd, since the time of the child's death, they, nevertheless, contain'd very small particles of fat, which were agitated by a tumultuary motion, one with another. The lungs, on the back part, were somewhat black, and particularly the right: they were found nevertheless. In the pericardium was a little water: but in the heart was not the least appearance of any polypous concretion. In the brain was found a little serum.

6. A diarrhoea, join'd with a cough, and an itching of the nostrils, might have given a suspicion of worms in this little boy: none of which however were found. But the itching of the gums really shew'd that teeth were about to cut through them. For so he who saw the case judg'd, that is Valsalva, when he mark'd out this observation, in his little index, in the following manner. "A diarrhoea with difficult dentition, and convulsive motions." And how easily dentition may excite convulsions, you yourself are not ignorant, and I have, on a former occasion, confirm'd (*k*), by giving you two fatal cases of infants, at the same time pointing out where I shall demonstrate, by what means it also brings on a flux of the intestines, and by what means this, if it be moderate, prevents convulsions coming on. And from hence you perceive, how very dangerous it must be, for an intestinal flux to be suddenly and totally stop'd, at this time, in particular, as a sudden and total stoppage thereof, at other times, is never without considerable danger. But if the matter that has been discharg'd by stool is, moreover, of the most pernicious properties, this matter being confin'd within the body, may not only bring on death, but a very speedy, and a very violent one. And that the matter, in this case, was of a malignant and destructive nature, is not only shewn by the colour of the stools, and the singultus, but by that very strange, and unusual, motion in the particles of the fat, whatever it was (for so strange it is, that I should credit few besides Valsalva, in this matter) is more than sufficiently demonstrated.

But to speak only of the colour; do not imagine, because that very black colour, of the discharg'd matter, succeeded to the bloody tincture, that the

stools were nothing but blood. For Valsalva was not a man of this kind, that he could not easily distinguish blood, when discharg'd, or remaining behind, in the intestines, after death, if it had really been blood. Wherefore, either that tincture, which was suppos'd, by the women, to be owing to blood, was some portion of very ill-condition'd humour, then first beginning to burst forth, and to tinge the matter, that was before contain'd in the intestines, or if it was really bloody, it distill'd from some small vessels, which the more acrid part of this deprav'd humour had eroded. And this recent humour being encreas'd, by the addition of other juices, either in the gall-bladder, or in the cavity of the intestines, the nature of which you may, in some measure, guess at, by the experiment of de Graaf, which is also copied in the Sepulchretum (*l*), gave that very black colour to the whole mixture, and represented the atra bilis of the ancients, by its pernicious effects. How violent, and how speedy, a death it also brought on, in that smith, of whom I wrote in the last letter (*m*), you certainly remember. Nevertheless it sometimes happens, though but seldom, and with difficulty, that a person in these circumstances is sav'd. And as I happen'd to meet with this, in another smith, in the year 1710; I will not make any scruple to give you the heads of that observation, in this place.

7. A young man of a slender habit, but strong, both in regard to constitution, and years, nor less adust by means of his art, than by his temperature, being subject to hæmorrhages of the nostrils, and having been long without them, was seiz'd, in the beginning of the spring, with a fever of a malignant kind. Some persons of the first rank, in the place of my nativity, who were fond of this man, as a very ingenious artist, beg'd of me, that I would enter into consultation with his physician, who, though an elderly man, had no objection to this step. The reason of this desire was, that the case was reduc'd to a great extremity. For to the other symptoms had been added, on that day, so great a discharge of blood from the nostrils, that, as within five hours, it had been discharg'd to the quantity of seven pounds, nor could as yet be stop'd, by any means whatever; the man's strength and pulse were almost ready to fail.

We both of us, in conjunction, did all in our power to restrain this hæmorrhage, and to obviate the other symptoms. But scarcely had the blood begun to be stop'd, when what we were afraid of came on, that is the fever, being exacerbated, according to custom, about noon, renew'd the hæmorrhage. Being again busi'd in giving assistance to the patient, behold black stools began to be discharg'd. And although it was natural to suppose, that these were part of the blood, that had flow'd down by the posterior foramina of the nostrils, into the fauces, and stomach, the patient assur'd us that he did not perceive any thing to trickle down, from the fauces, into the gula: and this was confirm'd by the appearance of what had, in the mean while, been brought up by vomiting, in which there was nothing bloody or black. And having after that inspected all the cloths, upon which the discharges from the intestines were receiv'd, and seeing a black colour indeed, but nothing

(*l*) Ad. obs. 15. sect. 12.

(*m*) N. 16.

bloody amongst them; it not only brought to my mind the well-known predictions of Hippocrates, but also the case of that young man, mention'd by Ballonius (*n*), who being affected in a manner very similar to that of our patient, and having discharg'd black stools, after too great a hæmorrhage from the nostrils, died on the seventh day of his fever.

And there was here so much the greater reason to fear, because, as Ballonius, nevertheless, suspected that the blood had flow'd down, from the fauces, into the stomach, we were, as I said before, but little at liberty to suspect the same, and indeed less and less so, the more we consider'd all things.

For as the ancient physicians, in the opinion of whom is Sennertus (*o*), divide black stools into those which are bloody, and those that are owing to a natural melancholic humour, and, finally, into those which are from atrabilis, and teach us, that the two first kinds are attended with less danger, but that the last kind is extremely dangerous, that is to say, those that "are black, shining and acrid;" these which we saw were, certainly, very black, and shining, and, as the patient complain'd, acrid also. On the following night he had the same kind of stools, except that they were somewhat less fluid. Yet after that he had no more of the same kind: but the milk which was thrown up, by way of glyster, he discharg'd at first ting'd with the colour of tobacco, and on the following days of a brown colour, mix'd with a slight yellow: yet whatever was discharg'd, had the most offensive smell. Notwithstanding this deplorable state of things, however, the patient, by the blessing of God, escap'd, and his former health was entirely restor'd; but he was not free from his black stools before the twenty-fourth day, and they had begun about the sixth day of the fever; nor was he, after that, without many various, and grievous symptoms, which for a long time afflicted him.

Amongst these, were pains of the belly, thirst, a roughness, and blackness of the tongue, and though he drank often, a dryness; and while he drank, there was a sound, as if he threw what he drank down into a deep place, his voice was hoarse, and low, he had a trembling of his hands, a subfultus of the tendons in his wrists, an inconstancy of the pulse, and often a smallness, and, if you press'd upon it, a great weakness, and sometimes a very considerable, and almost inexplicable, inequality, but always a frequency, and especially when the fever was very hot, and violent, which was very often the case; the respiration was various, so that it was sometimes deep, and even, sometimes, not without difficulty; his sleep was, at first, laborious, and after that there was an excessive, and almost continual, drowsiness, he even slept with his eyelids brought near together, and yet with his eyes not quite shut, he was sometimes not quite free from delirium, had a slowness in answering, a difficulty in forming his words, and a forgetfulness of giving notice, when he had occasion to go to stool, or to make water, besides being heavy of hearing, and lying on his back, as if the power of turning himself, on his side, was, at that time, taken away, whereas, at other times, there was, for

the most part, a greater power of exertion in the muscles, and a greater readiness to take nourishment, than that heaviness, and the other symptoms, I have mention'd, seem'd capable of permitting.

As many of these symptoms, and the worst of them, in particular, shew'd themselves more than once, and for a long time together, they caus'd us to be, for a long time, more in fear, than in hope, as to the event of the disease, while every other person whatever, who saw the patient, pronounc'd him quite desperate. But nothing seem'd to us, to be of so much advantage, as the great quantity of urine, that was discharg'd; for the sweats were but little, and not frequent, nor did they ever appear over the whole body, and what the intestines discharg'd, was generally but small in quantity, and not of such a nature as to be likely to give relief, notwithstanding a worm was, sometimes, observ'd in the stools.

8. But black stools, of that kind, are pernicious, not so much on account of their quantity frequently, as in their effects, and are always the proofs of a very ill-condition'd humour, which gives rise to them.

Yet other intestinal discharges, that are equally free from blood, as the yellow, the green, the watry, and others of this kind, are, sometimes, not destructive by the pain they create only; but by their quantity also. And all these excursions generally owe their origin to some stimulus, that irritates the intestines, by what means, or from what part, soever, it got down into them: for as we see that a great quantity of humours is discharg'd, by means of medicines violently purgative, so we may suppose that from some stimulating fluid, which is generated within this canal, or sent down thither, from the arteries, the same thing must of course happen.

For besides the pancreas, the liver, and the gall-bladder, there are, by reason of the very large extent of surface, in the intestines, innumerable passages, though very small indeed, through which any thing unusual may be separated from the blood. And these same innumerable passages, when the intestines are frequently, and for a long time together, stimulated, convey an incredible quantity of serum. Nor are we to suppose, with the common people, that whatever is discharg'd of a yellow, or green colour, is all of it bile, especially since from the experiment of Diemerbroeck, which you have also in the Sepulchretum (p), it is easily perceiv'd, with how small a quantity of bile, a great quantity of water may be ting'd. Nor is there any necessity for ascribing the griping pains, with which the patient is then affected, to the quantity of bile, which is mix'd with the stools, since Willis has describ'd diarrhoeas "almost watry, and limpid (q)," which he nevertheless chose, on account of the "griping tortures," that attended them, to call dysenteries. And those which attack'd many of the inhabitants of London, who were, the day before, strong, and in good health, particularly in the autumn of the year 1670, reduc'd their strength to so great a degree, within the space of twelve hours, that they seem'd just ready to die, and that not from the great quantity which had been discharg'd; for he says, "that if an equal quantity of

(p) In. fin. schol. ad obs. 3. §. 1. sect. 9.

(q) Pharmac. Ration. l. 3. c. 3.

"pure

“pure blood had been discharg’d, it could not have produc’d equal weakness.”

But on the contrary, even the vast quantity of serum alone, that was discharg’d, not only brought on an immediate swooning, in the woman of whom Marcellus Donatus gives the history (r), but also brought down almost to the brink of death, the notary of whom Poterius speaks (s); for neither of these authors mention any thing of pains; but the former says, “that by one excretion, so great a quantity of clear water was discharg’d, as to fill a vessel of a very large size, that was made use of to receive it,” and the latter, “that through the whole of one day, more than forty pints of serous matter was discharg’d.” Yet I would not deny, that there might be some irritating matter in these discharges, join’d with a redundancy of serum in the blood, and perhaps with some laxity of the intestines. I only say this, that it does not seem as if the pains had been so severe, as to make them deserve notice, and that after so great a quantity of serum having been excreted, nothing else was wanting to explain what happen’d to both of them.

For the blood vessels cannot contract themselves so soon, as to embrace, closely, the column of blood that is greatly diminish’d, though this is extremely necessary, in order to put the blood into a proper motion, especially when it is in great measure depriv’d of its fluidity, and, of consequence, gives more resistance to the force of the vessels upon it, not to say any thing of the necessity there is of the same fluid humour, in order that those secretions, from the blood, may be speedily, and properly made, without which life cannot subsist, nor will I enquire, whether for these reasons, where the question is of a very great, and sudden, effusion from the vessels, it is of worse consequences for serum only, or for blood, itself, to have been discharg’d, at the same time; for notwithstanding serum may be more speedily and easily repair’d, yet the blood which does not remain in the vessels, without its necessary portion of serum, is neither unfit for the secretions, nor gives more resistance than before, to the causes which put it into motion.

9. And I could wish it had happen’d to me, rather to bandy about this question in dispute, than to experience any thing of the kind myself, in any shape. But in the year 1733, when in consequence of a letter from his eminence the cardinal Annibal Albano, to which it became me to be obsequious, I travel’d to and from Forli to Pesaro, and from Pesaro to Forli, on post-horses, for the sake of consulting with a certain physician, I was attack’d with so great a flux of the intestines, that within twelve hours, I discharg’d, at least, sixteen pints of almost limpid water. The pains were slight: the stools not very frequent, but very large: and I know not how long they might have continu’d, if a slight nausea had not put me in mind to try the effects of vomiting, by drinking a little quantity of warm broth. And although, naturally, I am by no means inclin’d to vomit, yet it succeeded so happily, that having thrown up a greenish little body, which seem’d to be a small leaf of a boil’d herb, the nausea, and the intestinal flux, were cur’d at the same time. But whether it was a real leaf, and if it was, where, or when, I had eaten it, I could not find out, unless this might have happen’d on my jour-

(r) De med. hist. mir. l. 4. c. 20. j

(s) Observ. cent. 2. c. 62.

ney, while I was taking some refreshment, in an inn, hastily, and just while the horses were chang'd; for in this manner I might have swallow'd it down, whatever it was, unnotic'd.

How much danger I had then been in, I better understood, when, on the day following, I perceiv'd that my body, and particularly my face, and hands, were grown thin, and lank, as if it had been from a very long, and acute disease, and felt so great a dryness in the mouth, and fauces, that although I wash'd them over and over again, I found no advantage from thence, and I saw that the water, which I had us'd for that purpose, when I threw it out of my mouth into a basin, was made almost black in the mouth. And these symptoms, together with a lassitude, lasted two or three days, and were, by degrees, diminish'd. But the loss of appetite for food of all kinds, and what you will be more surpris'd at, in such a dryness, even a loss of appetite for drink, lasted somewhat longer, till a broil'd fish, and a particular kind of wine, which, in its own nature, is bitterish, began to be desir'd by the stomach, and be well born by it. All which circumstances I was willing to recollect minutely, and write to you, as they were not receiv'd from any other hand, or observ'd in any other person, but taken by myself, and from myself; and these such as are not easily to be met with, among those who have written upon diarrhœas, not even Carolus Piso excepted, who is said (†) “to have given a perfect description of this diarrhœa,” that is of the watery diarrhœa. For if you read over the whole chapter, which is at the same time quoted, and is entitled *De Diarrhœa serosa* (u), you will not find a case to compare with mine.

10. And if you enquire into the causes of this disorder, you see that the primary cause had been in the stomach: and I think you cannot doubt, but motion, and irritation, from which an excretion of serum is brought on, may be propagated to the intestines, from a stimulus affecting the stomach. Turn, in particular, to the observations of Jo. Riolanus, I mean the elder, which you also have here in the Sepulchretum (x): you will see that a matron died, within about fourteen hours, of intestinal discharges, “similar to white water, milky indeed, but liquid, and in such a quantity, as to fill a large basin, every time she went to stool,” and that the cause of this was found to be “an ulceration in the fundus of the stomach.”

But whence came so great a quantity of water? In regard to my own case, I will first say, that in the preceding summer, I had made use of it, to temper those generous wines, with which only, my native place, at that time, abounds, and had drunk water, in greater quantity than usual, some part of which, notwithstanding when I was seiz'd with that flux, I seem'd to myself, and to others, to be in very good health, might perhaps have remain'd mix'd with my humours in rather a greater quantity than was necessary. And on the three days, which had preceded the two days, whereon I travel'd, and on the very day in which I was seiz'd with that flux, there had been very great, and almost continual showers of rain, so that I might have drunk in a

(†) Vid. commerc. litter. a. 1734. hebdom. 42. popt. num. iiii.

(u) Observ. de præteritis, hæten. morbis ab aqua oris sect. 4. c. 1.

(x) Sect. 10. obs. 18.

great quantity of water, from the moist air, by the absorbing surface of the lungs, and the whole body in general.

In the last place, this happen'd to me in the beginning of October; for you have seen, that the watery fluxes describ'd by Willis (*y*), and you may see that the flux, which I refer'd to, as describ'd by Poterius (*z*), happen'd in the autumn, and near to the same time of the year, that, likewise, which is spoken of by Marcellus Donatus (*a*), as did also the three first, which are taken notice of by Piso (*b*). For when the air begins to grow cool, at the decline of the Season, this watery humour, which flow'd copiously from the body, during the time of the summer heats, and not by means of sweat only, but by means of insensible perspiration also, is now retain'd, and added to that, with which, for certain causes, the bodies of certain men do, at that time, more abound; so that it is not to be wonder'd at, if where an irritation of the intestines comes on, as it did come on in me, with a great agitation, and concussion, of the body, and humours besides, from travelling very fast to and fro on horseback, and that for a long way too, it is not, I say, to be wonder'd at, if that does sometimes happen, which happen'd to me then.

II. But if you are not content with the many causes which I have hinted at, and think that some other ought still to be enquir'd into; that will be better, than if you were to acquiesce in one of them, I mean the autumnal season. For the same time, the same year, the same city, that is the city of London, had intestinal fluxes spreading through it epidemically, without blood indeed, but attended with griping tortures; yet so different were these disorders, that if you compare the descriptions of Willis (*c*), and Sydenham (*d*), one with another; you will be very much surpriz'd to find, that although both of them give you an account of the fluxes, with which the inhabitants of London were troubled, in the autumn of the year 1670, the one describes "watery fluxes," and the other "mucous fluxes," nor does the former take notice of so much as one that was mucous, nor the latter of one that was watery.

How could this happen? For my part I should suppose, that in a city of this kind, which is, perhaps, more than any other, large and populous, it had happen'd to each of them, according to their descriptions, so that the one met with none but watery fluxes, and the other none but mucous. And this difference I should suppose arose from hence, that as in various parts of a great city, there may be a various constitution, and mixture, of air, various arts, and occupations of men, and other circumstances of the like kind, some bodies may abound with a more fluid, and others with a more lentescient, and mucous, serum; so that, although there might be the same kind of irritation in the intestines of all; the fluid, nevertheless, which is press'd out from the internal surface of their tube, will not be the same in all.

But if mucus, or serum, are now and then discharg'd, ting'd with any other colour, whether this is added by the bile, or they appear in this manner of themselves, there are, and have long been, many physicians, who, following the example of those English gentlemen, provided there be frequent dil-

(*y*) Supra n. 8.

(*z*) Ibid.

(*a*) Ibid.

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(*b*) C. 1. *ibid.* cit. n. 9.

(*c*) Vid. c. cit. supra ad n. 8.

(*d*) Obf. med. circa morb. acut. sect. 4. c. 3.

charges, not unattended with gripings, and pain, do not hesitate to call fluxes of this kind, though they are not bloody, dysenteries. So I remember, when I formerly liv'd at Bologna, that epidemic fluxes of this kind, which spread about at Modena, were call'd by the physicians of Modena, in letters that they sent to the physicians of Bologna, dysenteries, which appellation the latter did not disapprove. Letters of this kind, in particular, I read, that were sent to Albertini, by one of whom I have already spoken to you (*e*), I mean Jo. Francisco Bernardoni, and in these letters, I read amongst others, a history, which I think ought not to be pass'd over here, as it has the dissection join'd to it. For as, by reason of the same griping tortures having attended these fluxes, which attend dysenteries, a suspicion had arisen of blood being discharg'd, but conceal'd under other colours; Bernardoni was willing either to remove, or confirm, this suspicion, by dissection. And this was the manner, in which he related the case, in those letters, which he afterwards confirm'd in my presence, with his own mouth.

12. A priest, who labour'd under an intestinal flux, discharg'd various kinds of humours, and these discharges were attended with very severe pains of the bowels, but in them there appear'd neither any thing bloody, nor purulent. He died on the thirteenth day of the disease.

All the intestines being examin'd, closely, on their internal surface, and that more than once, shew'd no where any erosion, much less any ulceration. And what seem'd more surprizing still, they were not without that mucus, as it is call'd, with which they are naturally smear'd over.

13. But is it so likewise in bloody dysenteries? For I shall call them bloody here, to distinguish them from those that were without blood, which I spoke of last; though, at other times, and indeed presently, I shall call those that are bloody, dysenteries, without the addition of any epithet whatever, according to the custom of the Greek physicians; the ancient Latin physicians us'd to name them *tormina*. Both of which appellations you may, in particular, learn, from Celsus (*f*).

Celsus does not doubt, but that in a dysentery, "the intestines are ulcerated, internally," and that blood "is discharg'd from them, sometimes, with a kind of mucous matter, and that, at other times, some kind of fleshy portions, as it were, are discharg'd, together with the blood," following the opinion of the more ancient physicians, and amongst these, of Hippocrates (*g*), who had, nevertheless, call'd these fleshy portions, "a kind of caruncles." And indeed the intestines are often ulcerated: but not always. Both of which positions are to be demonstrated.

For, in the first place, there are some who assert, that this scarcely ever happens, and persons of this kind have even come to the knowledge of the celebrated Fantonus (*b*). And as he has given two of his own observations, in opposition to their opinion, so you may also add others, not only from this eleventh section of the Sepulchretum, but even some that are taken from other places, and particularly from the commentary of Brunnerus (*i*). For

(*e*) Epist. 23. n. 2.

(*f*) De medic. l. 4. c. 15. in princ.

(*g*) Sect. 4. aph. 26.

(*b*) De observ. med. & anat. epist. 4.

(*i*) In pancr. secund. c. 7.

Brunnerus saw, in a dysenteric woman, the mouths of the glands of the duodenum "eroded:" and in others, who had labour'd under a long flux of the intestines, he also found "ulcers of a cancerous nature, as it were (*k*)," and in one (*l*) who had been troubl'd with a cæliac flux, and in another (*m*), who had been afflicted with a lientery, "an ulcerous disposition," in the last mention'd patient, of the colon; and in the former, throughout the whole tract of the intestines, he reckon'd up "more than sixty little ulcers:" and these things I was willing to take notice of, that you might know, what causes may sometimes happen, so that the intestines being irritated, where the ulcers are, by the contact of the ingesta, which pass that way, these ingesta may be so much the sooner expell'd, without giving time for the chyle to be perfected, or even extracted, and that you might at the same time conceive, if in these kinds of fluxes, the intestines are sometimes affected with ulcers, how much more easily they may be seiz'd with the same disorders, where the violence of the pain is a proof of there being so much a greater degree of acrimony, I mean in the dysentery. And lest we should seem to digress from our subject, attend to two observations of Valsalva's, that is, not only the one which is describ'd above (*n*), of a young man, in whom a diarrhœa, without tormina, succeeding to a dysentery, he found the latter part of the ileum, and the first part of the colon, ulcerated; but this also which I shall immediately subjoin.

14. A man of thirty years of age, was seiz'd with a dysentery. This continu'd a long time, till at length he was seiz'd with a spitting of blood, and with death.

In the belly, the small intestines, indeed, were found to be unhurt: but the large intestines were, in some places, ting'd with a black colour, and had some of their glands entirely eroded, the remaining glands being all drench'd with a bloody humour, in the very excretory orifice. In the gall-bladder was but little bile.

In the cavity of the thorax, towards the inferior part, was no small quantity of blood extravasated. At the inferior part, also, the lungs were stuff'd up, and both lobes adher'd, on their sides, closely to the pleura, which was itself, likewise, evidently injur'd. The right ventricle of the heart contain'd a polypous concretion.

15. The appearances of disease, which were found in the thorax, refer to another subject. And, those in the belly, to the present. But as these things which Valsalva has remark'd, of the glands of the intestines, agree both with those that you will see produc'd from Peyerus, in this section of the Sepulchretum (*o*), and with those that you have seen in the first, from among the observations of Brunnerus, just now pointed out (*); that one thing only, in regard to little bile being found in the gall-bladder, would be contrary to the opinion of Spigelius, if he, as some learned men assert, had pronounc'd the gall-bladder to be "large in dysenteric bodies," whereas he has only said, that he had "frequently" seen it so (*p*). Yet, if we examine this whole section narrowly, we shall see it observ'd but once by others. For Cummenus (*q*), was the only person

(*k*) C. 10.

(*l*) C. 7.

(*m*) Exercit. de gland. in duodeno. §. 6.

(*n*) N. 2.

(*o*) Schol. ad obs. 4.

(*) N. 13.

(*p*) De hum. corp. fabr. l. 8. c. 13.

(*q*) Obs. 1.

who found “the gall-bladder to be very large, and very full of bile,” and in the body of a woman. Bontius (*r*), and Lamonerius (*s*), found it to be distended indeed; but the latter with pus, and the former with a white humour, “like a pulvise of starch, so that no traces of bile were left,” whereas Spigelius has declar’d, that the increas’d size of it was owing to “the quantity of bile, with which it was fill’d.” But Franciscus Platerus (*t*), not only found it not distended with bile, as others likewise seem to have found it, who say nothing upon the subject, but even “quite empty.”

Moreover, the patient of Platerus had the intestines ulcerated, after a dysentery, which continued “some days;” and this I observe, lest you should be apt to imagine, that this did not happen, but after dysenteries of long continuance. And there were innumerable little ulcers, for they took up the whole extent of surface in the ileum, and were “the breadth of three fingers distant from each other;” so that this observation may be, in some measure, compar’d with the observation of the celebrated Bassius (*u*), who, after a dysentery, saw the same intestine distinguish’d with ulcers, “at the distance of almost a finger’s breadth from each other, and sometimes, at the distance of a joint of the thumb, proceeding nearly in “one tract, or series,” as the figure which he added (*x*), has also express’d (except that he seems rather to have represented the jejunum, than the ileum) confirming the description, in which the same opinions, of Peyerus, that I pointed out a little while ago, are strengthen’d by a probable conjecture, I mean that, as those bodies, which he call’d glandular plexusses, were wanting, and as every ulcer seem’d to occupy one of the seats of these glandular plexusses, it was very supposable, that the beginnings of the erosions, had been in the same plexusses, which were, at length, entirely consum’d.

Nay, indeed Brunnerus, in that observation (*y*), wherein he number’d more than sixty little ulcers, has testified that these ulcers, “had their situation in no other part, than in these plexusses.” And certainly, that in intestinal fluxes, the humours are thrown upon the intestines, by these, or other glands, may be even argued from their magnitude being increas’d, as happens in all other glands whatever, while their secretions are greater than usual. Thus in the body, wherein, after a long intestinal flux, the same Brunnerus found ulcers, about the extremity of the jejunum (*z*), he not only saw “glandular tuberosities,” in that part likewise, but also found the internal coat of the intestine, become much thicker, than it naturally is, and this coat “seem’d, from the beginning, to the end, to be entirely glandular and luxuriant with glands.” And of his glands of the duodenum he says (*a*), “they are generally found to be much thicken’d, in those who die “of diseases in the intestines, such as a diarrhoea, or a dysentery:” and he says that the same glands, had even “become indurated (*b*),” in that dysenteric woman, in whose body he saw the orifices of them “eroded,” as I have already said.

(*r*) Obf. 6.

(*s*) Obf. 19.

(*t*) In addit. obf. 3.

(*u*) Obf. anat. chir. med. dec. 3. obf. 7.

(*x*) Tab. xi. fig. 1.

(*y*) Supra ad. n. 13.

(*z*) C. 7. ibid. cit.

(*a*) In earum demonst. anatom.

(*b*) Ibid.

16. However, this last observation of Brunnerus, and the two which I related a little before (*c*), from Platerus, and Bassius, and a part of that which was given from Valsalva, in the beginning of this letter (*d*), even of themselves, sufficiently show it to have been too hastily pronounc'd by Panarolus, as you have it here in the Sepulchretum (*e*), "that an excoriation, " and corrosion, could not be brought on in the upper intestines of dysenteric patients, as happens in the large intestines, and particularly in the " colon." I confess indeed, that in most of the observations, among which are even those two of the celebrated Fantonus (*f*), it was found to be so, and I should readily believe Panarolus, when he says that it was equally so; in the dissection of all that considerable number of those " bodies," to which he refers: and I shall also agree with his reasoning upon the subject, that a corroding humour may very easily flow on, in the small intestines; but that in the colon, it as easily stagnates, by reason of the cells: and I would even add, that a corroding humour is often temper'd, and made much milder, in the small intestines, by the mixture of chyle, and more often by a mixture of the watery, and mucilaginous, portion of the remedies, that are taken in; but that the humour goes down into the large intestines, after these meliorating fluids have, chiefly, been taken up, by the chyliiferous vessels. All these things, I say, I see and confess: nevertheless, to omit other methods of reasoning, by which I might show, that the very opposite supposition may sometimes take place; there can be no force of reasoning sufficient, I do not say, but there can even be no number of observations, whatever, sufficient, to prove that what has been really seen, at any one time, cannot come to pass.

17. But whether there are ulcers in the small, or in the large intestines; it sufficiently appears, from all these observations, that the intestines were really ulcerated, in those dysenteric bodies, from which they were taken. Yet in those dysenteric patients, whom we have it not in our power to dissect, are we also to suppose ulcerations for this reason, that, as Celsus says (*g*), they have discharg'd some kind of mucous portions, with blood, and sometimes portions of flesh, as it were? it is worth while accurately to consider this question. And formerly, indeed, they did not doubt, but from the very beginning of this disease, some fat bodies were excreted, which they suppos'd to be the internal fat of the intestines. But this error was refuted, by those who demonstrated that the fat was not on the internal, but on the external, surface of the intestines, and with them by Caspar Hoffmann (*h*), who also show'd that a certain whitish body which had been discharg'd from the intestines, and was brought to him in a dry'd state, was taken for fat without reason, because it did not, in the least, take flame, when applied to a flame, and emitted a smoke which was perfectly inodorous. At present, however, as some substances, which were discharg'd in the same manner, have been found to be really adipose, from an experiment of this kind made by Tulpus (*i*), and Stalpart (*k*), there are not wanting learned men, who teach

(*c*) N. 15.

(*d*) N. 2.

(*e*) Obs. 15.

(*f*) Supra, n. 13.

(*g*) Supra ibid.

(*h*) Apolog. pro gal. l. 2. f. 4. c. 122.

(*i*) Obs. med. l. 3. c. 13.

(*k*) Cent. 1. obs. 61.

that they must, "without doubt," have proceeded from the fat, which is on the external cellular coat of the intestine.

Yet to me, where there is no suspicion either of consumptive colliquation, or of a deep ulceration of the intestines, it will seem less improbable to account for these discharges of fat, in concert with Stalpart, and Riverius, whom he quotes (*l*), from fat being plentifully eaten, and not concocted; though I might, perhaps, allow of fat being brought, quite from that cellular coat, when I have found that there are ulcers, which open a passage sufficient for this fat to get into the cavity of the intestines, provided it be certain, that this fat does not then come forth, in the form of pus, or ichor. But because the intestines are ulcerated; much more seldom in dysenteries, and much later in the course of the disease, than this white matter, which was suppos'd to be fat, appears; what shall we then say it is, or from whence shall we say it proceeds? Without doubt it must be mucous, as Celsus also call'd it, agreeably to what I have said a little while ago, and as the moderns call it, if it be not very thick; but if it be very thick, we must even suppose it to be polypous.

For, as the glands of the bladder, when irritated, secrete a greater quantity of humour, and not of the same nature with that which they secrete in perfect health, so the glands of the intestines, likewise, secrete a greater quantity of humours, and of a different nature; for which reason, in both cases, a white and mucous matter appears. But if there be, moreover, that disposition, in the blood, of easily coalescing into polypi, this humour will be more prone to concretion; and that so much the more, where blood of this kind having exsuded, or having been extravasated into the cavity of the intestines, has been added thereto. For thus, while a part of the blood shall remain in the cells of the colon, the watery part being taken up, and the red part subsiding, those fibres of the blood, as they are call'd, which will be left behind, may be easily compacted into polypous concretions, and by reason of their whiteness, when, soon after, discharg'd with the excrements, may be taken for fat here also, as they were, formerly, so often in the heart and the vessels, where they belied the appearances of vessels, and organiz'd parts, and deceiv'd the inspectors.

18. In either of these ways then, or in both of them, or even in any other way, among those that Lancisi has pointed out (*m*), according to the various constitution of the patient, and according to the various nature of the disease, and, finally, according to the time, place, and manner, in which the lentescient matter is retain'd, and dispos'd, not only the origin of those fat bodies, as they seem'd to be, but also of the shreds of membranes, and even of large membranes that are said to have been discharg'd, may be understood, and the origin of some of those bodies, that are call'd fleshy by Celsus, may be very easily accounted for, that is to say, if the whole portion of red blood be not press'd out, from its white, and coalescent, fibres. And from hence you may also perceive, how cautiously we ought to use that prædiction of Hippocrates (*n*): "if a person labouring under a dysentery, discharge a "kind of caruncles, as it were, 'tis a mortal sign:" nor, indeed, was this

(*l*) In schol. ibid.

(*m*) Diff. de tripl. intest. polypo.

(*n*) S. 4. aph. 26.

caution overlook'd, by him who treated, with great perspicuity, of polypi, I mean the very learned Paſta (o).

But that which we now call a mucous, or polypous, matter, the ancients were, in general, accusom'd to call pituitous, and viscid, and some of these were even us'd to acknowledge those things, which I at present insist on. Thus not to turn to the most ancient of all, I observe that Jacobus Berengarius (p) has written the following words: "and I myself have seen, that concretions, like pieces of thick leather, have been generated in my intestines, from pituita, and in like manner, a pituitous flesh, in some measure red, and equal, in size, to a pretty large nut." And Fernelius suppos'd the matter of a firm body, which was a foot in length, and pierc'd through with a middle duct, to be of the same kind; which body was discharg'd by the ambassador of the emperor Charles the fifth, who was, by that means, restor'd to his former health. I say nothing of Gabucinus and Platerus, whose opinion was taken notice of by Sennertus (r), nor was unknown to Lancisi, when he readily confess'd (s), that both of them had asserted that before them, were no instances of the tœnia, or tape-worm, which is a kind of intestinal worm.

But Sennertus himself, I commend still more (t), because he suppos'd that the membranes, which were discharg'd, from dysenteric patients, who recover, were nothing more than "mucous excrements, that receive this form in the intestines:" and that it was by no means necessary, to suppose that this mucus should always be excreted, either in its own proper form, or in the form of blood, mix'd with this mucus; but that it may put on another form; for, says he, "we see every day, that the fibrous part of blood, when thrown into warm water, grows white."

Yet you see how much nearer, that which Zollicofferus (u) did at length more expressly throw out, in the year 1685, comes to this point; I mean when discoursing of those polypi, which are found without the blood vessels, or reservoirs, and among them, of a polypus then found by Sponius, in the pelvis of the kidney, "to which class," says he, "even that pituitous concretion might perhaps be refer'd which Justus Lipsius discharg'd by stool, in the shape of the intestines, and believ'd to be the very intestines themselves." And this opinion was at length very particularly, and clearly illustrated, and confirm'd, by Lancisi, in many different ways, and not after the manner of one who had any doubts upon the subject.

19. It appears therefore, that in a dysentery, bodies consisting of fat in appearance, and bodies seemingly fleshy, and membranous, may be equally discharg'd from the intestines, without any ulcer having affected them: although Sennertus (x) denies, that he and Crato "could ever see such membranes, and jagged pieces of membranes, as others describe," even where there were ulcers. For these, certainly, had been seen, in those patients, whose recoveries describ'd by Meichnerus (y), and Saxonia, seem'd to him

(o) In not. ad hunc aphor.

(p) Super. anat. mundin. comm. 7.

(q) Pathol. l. 6. c. 9.

(r) Medic. pract. l. 3. p. 2. f. 2. c. 7. qu. 3.

(s) Diff. cit. epist. 2. ad Bianciard.

(t) Qu. cit.

(u) Diff. de polypo cord. §. 6.

(x) Qu. cit.

(y) Apud Schenck, obs. med. l. 3. ubi de dysent. cur. obs. 4.

but little credible. For the patient of the former, had often discharg'd, together with pus, membranes "of the length of a span," and the patient of the latter, a membrane from the ulcerated rectum, "of the length of an ell."

Indeed in this pantheon, which Sennertus quotes, I should suppose that what is publish'd under his name (*z*), deserves but little to be attended to, after the just complaints of Saxonia, against the publisher of it, Uffenbachius (*a*), especially as in the practical lectures of Saxonia, which were afterwards publish'd here, nothing of that kind has been found by me, but this only (*b*); with which Sennertus is also displeas'd; that Saxonia "had seen four dysenteric patients, in whom so large portions of the intestines were, every day, excreted, that they often exceeded the measure of three or four inches," out of whom two women recover'd. And one of these perhaps was she who, as Caspar Hoffmann (*c*) says, was shewn to him at Padua, by his præceptor Saxonia, and who, in a dysentery, had discharg'd a part of the intestine to the "length of a span," that is, as I suppose, if all these excreted portions were suppos'd to be join'd together. Yet there Sennertus has done extremely well in openly confessing, "that many things might happen, which he had not seen." And indeed, if a very few years had been added to his life, he would have read the observation of Tulpius (*d*), who saw it happen from severe pains, and ulceration of the intestines, that the whole internal membrane of the rectum was separated from the intestine, in such a manner, that being pendulous from the intestine, it might be seen by him and by many physicians, for two or three days together, its total separation being for some time prevented, by a firm adhesion, to the parts about the anus.

It also happen'd to me here, on the first of June, in the year 1729, that I was earnestly desir'd to assist with my advice, one Jacob del Vecchio, a Jew merchant, on account of a similar case. This man had been attack'd with a very troublesome pain at the rectum, in the decline of a malignant fever, together with a sense of weight, and obstruction: and finally, a thickish kind of membrane; as it seem'd, had lately begun to come out from the anus, which I saw hanging from thence; its length was equal to the breadth of six fingers, and its width exceeded an inch, its colour was cineritious, degenerating into livid, like that of membranes, which are affected with gangrene: yet it did not fall off, in consequence of being continued within the intestine, and connected to it, as far as the surgeon could observe, by examining very gently; for although, from the time of its exit, the pain was become milder, yet the blood issued forth now and then, and the fever was more considerable at that hour, than it had been in the morning.

Wherefore, having settled what seem'd proper to be done, in concert with the physician of the patient, who was my senior, I departed. And from him I was inform'd, on the following days, that the membrane had come away, being rather ruptur'd, by the constriction of the sphincter, as it seem'd, than found: that blood, and an ill-condition'd ichor, had again

(*z*) Panth. l. 3. c. 23. ut citat. Sennert.

(*a*) Vid. Saxon. praf. ad libros 3. de Pulsib.

(*b*) P. 2. c. 19.

(*c*) C. 122. cit. supra ad. n. 17.

(*d*) Obs. med. l. 3. c. 17.

issued out; and that a singultus, which terrified every body, had come on: nevertheless, that he had some little hope remaining, for this reason, because he remember'd that the father of the patient, who, when he was pretty far advanc'd in years, had had a similar, but a shorter, membrane come from the rectum, escap'd with life under his care, though with this inconvenience, that he could never retain his excrements afterwards: and because the son, although in the father no malignant fever had preceded, and no singultus had come on, was as yet scarcely five and forty years of age.

Nor was this well-reasoning physician, whose surname was *Marina*, deceiv'd in his hope, with whom having again settled these things which, as the state of the case then was, were necessary to be added to the former, it happen'd that a great quantity of pus being discharg'd, I saw the patient out of bed, on the sixth day of July, now manifestly recovering his strength, colour, and habit of body, and not only retaining his fæces, but even healing injections, which were thrown up. There was some pain indeed even then; but this was evidently more slight, nor was it any longer very troublesome, in that same situation where it had been before. Wherefore this patient also, as well as that of *Tulpius*, and others, whom, for the sake of brevity, I purposely pass over, recover'd, and even was still living, and in good health, when I dictated this history, from my manuscripts, which was about the end of the year 1747 (e).

20. But although it is very certain, that these patients escap'd with life, yet if you ask me whether it is equally certain, that they discharg'd real membranes, I shall readily answer, no. Nor indeed do I see that the nature of them has been sufficiently enquir'd into, which perhaps it was not possible for others also to do, as it was not possible for me, in bodies that were corrupted, and rotten, with putrefaction. And I see, that even where the intestines are ulcerated, polypous concretions may be more readily form'd in that place, either in a round form, such as *Lancisi* (f) has affirm'd that he had seen discharg'd by dysenteric patients, equal to three or four spans in length, or flat, in the form of a membrane, one of which kind the celebrated *Joseph Ant. Pujatus* (g) saw discharg'd by a matron, who labour'd under an ulcer of the rectum, the length of which membrane was almost equal to a span, and which he suspected to be of the same nature.

But as I deny that it is certain those former substances were membranes, so I deny its being certain that they were not membranes, and especially those which seem'd to adhere to the intestine, more than polypi are wont to do. And to confess my opinion to you openly; I believe that any part of the internal coat, of the intestines, may be separated by the force of disease, and come away, just as we often see it happen to that thin membrane, with which the parts of the mouth are invested, from the contact of very hot aliments. And this is certainly done without any, or at least without any very considerable, effusion of blood, without convulsions, and other dangerous symptoms, which some fear from the innumerable small vessels, and nerves, that go to the internal coat of the intestines, if this be really suppos'd to be separated; whereas a very great number of small vessels, and small nerves also, go to the internal coat of the mouth in like manner.

(e) Imo vid. etiam epist. 65. n. 6.

(f) Diff. cit. epist. 1. ad Bianciard.

(g) Dec. med. obs. n. 6. obs. 1.

Nor would I have you say, that the thin membrane which is then separat- ed in the mouth, is a continuation of the cuticle, or is at least, proportion- ably, correspondent to it. For the same person who call'd this *epitbelia* in the prolabia and cheeks, shov'd that there was also a similar *epitbelia* in the gula, stomach and intestines; and this person was Ruych (*b*): wherefore, if you will not suppose me to speak of any other part, at least suppose me to speak of this, which the acrimony of the humours, or a superficial gan- grene, after an inflammation, has loosen'd from the remaining part of the internal coat, and left to be involv'd in the excrements, and carried down- wards. But sometimes, you will say, membranes which are deposited are "pretty thick," as Saxonia says (*i*); and the cuticle is thin. And so it certainly is, unless it be embrew'd with a large quantity of humours; for hence the celebrated Fantonus (*k*) judg'd it to happen, that we often see it grow so very thick, from the use of blistering applications, as to become from thence, according to his conjecture, divisible into many laminæ, or to consist of a spongy substance.

But if you contend, that even in this way, the matter is not sufficiently explain'd by me; I then beg of you, in your turn, to explain to me the ob- servation of that very experienc'd surgeon Benevolo (*l*), of a membranous canal being taken away from the anus, equal in length to six inches, as broad as the rectum generally is, and so thick, that the sphincter ani seem'd universally, or almost universally, to have come away with this canal: and indeed, it was necessary to make use of medical, and chirurgical, reme- dies, for almost the space of a year, in order to heal up the ulcer of the intestine, and to remove the other inconveniences, which depended upon the separation of this tube, as well as to obviate the incapacity of re- taining the excrements, which remain'd in consequence of this separation. For in the same manner that you imagine you can conceive, how so thick a part of the intestine could be separated, without destroying life, you will much more easily conceive, how the internal coat which is so much less thick, may have been sometimes separated. And if you readily allow of this even in those who have recover'd, how much more readily must you allow of it in those who have perish'd? And if you had been present with the soldier of whom Bontius speaks, or with those patients of whom Sylvius speaks, each in this eleventh section of the Sepulchretum (*m*), and had said that the membranes, which they, certainly, discharg'd in a dysenteric flux; that was fatal to them, were really pieces of the internal coat; do you think you would have had reason to retract your opinion upon opening their bod- ies after death? Not in the least. For you would have found, with Sylvius, that the internal coat of the intestine was, "here and there, abraded," and with Bontius, that it was "quite abraded."

But was this abrasion universal? What Bontius does not say expressly enough, Piccolhominus (*n*) says, in an observation, which, in whatever way it is understood, was certainly worthy to have been copied in the Sepul- chretum. For he saw, "in a dysenteric patient, who suffer'd very excruciat- ing pains, and who always shiver'd with a kind of horror, upon taking

(*b*) Thef. anat. 7. n. 40.

(*i*) C. 19. supra ad n. 19. cit.

(*k*) Anat. corp. hum. diss. 2.

(*l*) 18. delle quaranta.

(*m*) Obs. 6. & 16.

(*n*) L. 2. anat. prælect. 15.

“ the first morsel of food, the whole internal coat of the stomach, and intestines, from the upper parts to the lower, (wonderful to see, and to hear, and almost too wonderful to be believ’d) abraded; and that which was left, and appear’d, seem’d fleshy, from the mouth of the stomach, quite to the extremity of the rectum, so that you would say it was a kind of broad fascia, universally fleshy; and that the stomach, also, was a kind of bladder, as it were, universally fleshy.” But of this observation mention will also be made hereafter (*o*), in which, as those things, that he subjoins soon after, show, the author himself acknowledg’d an inflammation of the fleshy fibres.

21. Now then, as it is more than sufficiently shown above, that those bodies which are discharg’d by dysenteric patients, in the form of membranes, sometimes are real membranes, but often are false membranes, and that they are no proof of the intestines being ulcerated, unless they are found to be real membranes; it would remain to demonstrate the same things, in proportion, of those also, that are discharg’d with a fleshy appearance, if it had not been, already, sufficiently shown above (*p*), how polypi may, in like manner, resemble these fleshy excrescences, or caruncles, without any ulceration of the intestines. One thing only, therefore, remains to be demonstrated; I mean, that these bodies are not always entirely made up of a false flesh, and when it shall certainly appear, from the examination of them, that they are so, some ulcer of the intestines is then to be suppos’d, provided there is no sign of an ulcer in the stomach: and this exception I make on account of those verrucæ, as the Arabians call’d them, of which I have treated in the twenty-ninth letter (*q*).

For although I have said that fleshy excrescences may exist there, without ulceration; I have not, however, denied that when they are broken off, and come away, an ulcer is form’d in the place from whence they were torn; and indeed that an ulcer must happen in this case is a self-evident proposition. Moreover I spoke, at that time, of the stomach, in such a manner, as to allow what I said to be transfer’d to the intestines, and I even suspected that a certain verruca of Avenzoar’s, was not generated in the stomach, but in the colon that lies beneath it, on account of the bigness which it seem’d to have in the stomach, if you press’d upon the epigastric region. Which suspicion I am pleas’d here so to confirm, by examples of the same kind in general, as to demonstrate, at length, that which I have advanc’d.

Jo. Baptista Cortesius (*r*), producing a passage of Galen, from which it may be understood, not only that indurated fæces, but also that “ a bulk “ of any body whatever, præternaturally existing in the intestines,” had already been reckon’d, by him, in the number of the causes that obstruct the bowels, has confirm’d the opinion of Galen, by this observation of his own, which was made upon the body of the Count de Caldarinis, a nobleman of Bologna. That is to say, “ in the cavity of the colon, was found a large “ portion of flesh, which, by its bulk, was the cause of impediment to the “ descent of the fæces, and by a disorder of this kind, which was a consequence of that obstruction, the patient was carried off. Which cause, “ being, as the author himself says, worthy of particular attention,” I was willing to describe in his own words, for this reason also, because in the

(*o*) N. 26.

(*p*) N. 17. & 18.

(*q*) N. 16. & 17.

(*r*) Miscell. med. dec. 4. c. 8.

catalogue of those authors, whose observations are transfer'd into the Sepulchretum, I have in vain sought after the name of Cortesius, as I did that of Piccolhominus likewise: neither is this observation found any-where in the thirteenth section, which is entitled *De adstrictione alvi*; but instead of it, a certain observation is taken notice of from Willis (*s*), as if it were certain "that a kind of fleshy excrescences, which adher'd to the larger intestines, "like the ears of a mouse, coming out in great number, and in twins, from "both sides of the colon and rectum, and at certain distances from each "other, like the branches of a tree," as if, I say, it were certain that these were not on the external surface, as they seem to me to have been, and were, perhaps, nothing else but the adipose appendices of the colon, and rectum, in which, the fat being consum'd, the sanguiferous vessels appear'd red; for these things Willis observ'd in a consumptive man, and says that he had seen "somewhat similar to this likewise in another consumptive body."

But, just as if it had been certain, that these excrescences had been on the internal surface of the intestines, and thus had brought on an astriction of the bowels, the case of a little boy is subjoin'd in the scholium, who, having discharg'd a large fleshy mass, that preserv'd the mark, by which it had adher'd to the intestines, was freed from an obstinate obstruction of the bowels. But you, however, by turning either to Willis, or to the other book of the Sepulchretum (*t*), in which the history of that man is given more at large, will not only be convinc'd of what I have said, but will, in particular, perceive this, that in a man who was seiz'd "with a spurious palsy, which affected "every limb of the whole body," so that he had scarcely any power of moving himself, there was no great occasion to assign any other causes besides this, for the bowels being costive, unless irritated.

But to return to the excrescences, that certainly were in the cavity of the colon; besides that "fleshy" one, which I look for in vain, in the Sepulchretum, remark'd by Joannes Rhodius (*u*) in a monk, who, "being troubled with colic pains, together with a vomiting of chyle, discharg'd his "glysters back again, without any excrement," by reason of "the colon "being obstructed by this fleshy excrescence;" there is an example of one, which very peculiarly relates to the present question, in the second of these two observations of the celebrated Fantonus, which I only mention'd above (*x*).

In a man whom a violent dysentery had, at length, carried off, he found "the colon ulcerated, not far from the cæcum, from which flow'd a humour of a purulent nature, mix'd with blood; and there he found, besides this, a fleshy, thick and round body, almost eight inches in length, "which, taking its rise by a slender beginning, and being connected by "that only, as by a peduncle, to the ulcerated coat, had the other part of "it pendulous in the intestinal tube, and taking up the greater part of "that tube: you would have said, says he, it was a large polypus of the "intestine; for the whole of this body exceeded the weight of a medical "pound." You see that this excrescence was attended with an ulcer, and

(*s*) Obs. 1. §. 4.

(*t*) I. sect. 13. obs. 1.

(*u*) Act. Hafn. vol. 4. p. 1. pag. 86.

(*x*) N. 13. & 16.

without doubt arose from an ulceration being continu'd through this long dyentery: and it could not be call'd a great polypus for this reason, that it had the nature of those polypi, which are spoken of above, but because it resembled a polypus of the nose, which is so call'd from its similitude to a polypus, not only in its figure, but in its nature also; for this that skilful and cautious anatomist pronounc'd to be fleshy.

22. Yet I do not doubt, but excrescences of the intestines may sometimes consist of both natures; as for instance, if to fleshy fimbriæ, which are not equal, or smooth, on their surfaces, particles of viscid pus, or intestinal juice, or extravasated blood, begin to adhere: and to these others, and still others, are added afterwards, so that the root and the nucleus may consist of real flesh, but the body of the mass that lies round it, or is added to it, and the appendages, may consist of that which has the appearance of flesh, and is not so in effect.

I was consulted, in the year 1736, for a nobleman, who, after having frequent discharges of blood by stool, join'd soon after, with a bilious flux of the intestines, and with a continual fever, which was, at first, slight, and after that acute, when this fever, and its violent symptoms, did not at all remit, from the use of the most suitable remedies, and even when that symptom, which was more violent than any of the others, I mean the pain of the belly, was of a sudden become extremely severe, had discharg'd, after a great quantity of blood, and by the help of the surgeon's hand, a certain body almost of the length of a span and half, but of a different thickness, and figure, in different parts. For on the upper part, it resembled an ugly head, as if that of a pretty large frog, with the mouth gaping; the other part of the body was almost round externally, internally hollow, and was two inches thick, till growing slender, by degrees, it terminated in a tail of a considerable length, and bifid, near its extremity.

If you remember what my opinion was, in almost the latter end of the preceding letter (y), of frogs, toads, and lizards, being discharg'd from the intestines, you will easily imagine what I thought, when I read this account that I have given you: nor was there any occasion, here, to suspect what you will read in the history of a certain miller (z), whose dissection is otherwise worthy of inspection, on account of chylous excrements having been constantly discharg'd, for a year and half together, and of being compar'd, for the sake of finding out the truth, with what I have hinted above (a), upon the celiac flux. But a toad was said to have crept in at his mouth, when he was asleep, and to have done much mischief within, till at length it was discharg'd by stool, in an over-grown state, and dead: which toad I could wish the excellent author of the observation had not been deter'd by the very filthy, and noxious stench, from attentively examining into, and not only by the eye, but with the assistance of the knife.

As far, however, as relates to our case at least, the learned physician, also, by whom I was consulted, made no hesitation, in contempt of vulgar opinions, to suppose that a body of this kind was of the nature of the polypi of Lancisi. Yet, as besides the external fibrous ligaments, by which it seem'd

(y) N. 21.

(z) Eph. n. c. cent. 3. & 4. obs. 163.

(a) N. 4.

to have been connected with the intestines, he describ'd a soft and distractile substance, almost of a black colour, whereof it consisted, and that made up of pretty strong fibres, with various glands lying betwixt them; and as he mention'd that the blood, which had flow'd frequently before, to the quantity of some pints, had ceas'd to flow, upon the removal of that body, and that purulent, whitish, almost cineritious, and extremely foetid, matter had succeeded, which sometimes preceded the discharge of the excrements, and sometimes follow'd them, and always with very great pain, and that these symptoms, and the acute fever, had continu'd, till, vulnerary remedies being given, which were afterwards succeeded by balsamics, these, and the other disagreeable symptoms, were first diminish'd, and at length quite remov'd; so that the patient (who liv'd many years after) desir'd nothing more of me, than to advise such methods, as might tend to preserve him from the return of this disorder: I was ready in my own mind to conjecture, that the beginning, and roots, of this body were excrescences, that had been form'd near the extremity of the colon.

For this situation was pointed out, by that very severe pain, which, without doubt, began below the navel, in the part where the colon generally has a kind of flexure, before it terminates in the rectum, and from thence, following the adhesions of the mesocolon, was extended quite to the back. I suppos'd therefore, that these roots, when they began to be eroded, ulcerated, and torn off, had pour'd out blood, and moreover, that when they were ulcerated pretty deeply, and all round about, the pain, and the other symptoms, had come on: and that, in the mean while, the fibrous and other viscid parts, of the blood, as it drip'd down, had adher'd to the excrescences, and increas'd their size, and by this means brought them into contact with each other, and form'd them into that shape, and appearance, which they had, when entirely pull'd away, and discharg'd. Yet as out of all the bodies of this kind, that I have read of, as being discharg'd from the anus, I can at present call to mind only one, and that spoken of by Peyerus (b), which was "furnish'd with blood-vessels;" and as where I plainly see any body to be furnish'd with these vessels, I shall pronounce that it is, certainly, to be refer'd to the class of excrescences; so, on the other hand, as I very well know, how easily we may be deceiv'd, and impos'd upon, in various ways, by polypous concretions, I shall answer only by suspecting, and conjecturing something of this kind, in regard to the others, which either are without these true vessels, or are not acknowledg'd for true excrescences, by the judgment of a cautious and experienc'd surgeon.

Thus I formerly gave credit to Valsalva, when examining, in conjunction with me, a bloody ichor that was discharg'd by a dysenteric patient, whose life was despair'd of, and finding therein a kind of little substance, which, if you consider'd only the colour, seem'd to be nothing but a small coagulum of blood; he, after enquiring into it very attentively, and considering it thoroughly, pronounc'd, without any hesitation, that it was a small excrescence of the ulcerated intestine. So, also, I should have given credit to the

(b) Exercit. I. de gland. intestin. circa finem.

very skilful Molinelli (*c*), if he had pronounc'd a hollow body, of a span in length, which a man who was afflicted violently, and for a long time together, with a dysentery, had himself drawn out from the rectum, to be "from the fungous flesh of ulcers," though he, in consequence of his great prudence, and caution, would by no means do this, but only said, that it was "not unlike" such a kind of flesh. And perhaps the celebrated Struvius (*d*) had his eye to nothing else, since, when he describ'd "a membranoso-carneous kind of mass," as he expressly calls it, of equal length with the other, of an inch in thickness, and "interwoven with a great quantity of fat," which was discharg'd from the anus, by a very violent straining; he was willing, as I suppose, to shew his own doubts, by prefixing this title, *De Massa Polyposa per alvum excreta*, to his observation: and yet such things had preceded, as might have given, as well as the dysentery itself, a just suspicion of a fleshy excrecence.

23. While I have been showing thus far, that in a dysentery, adipous, membranous, and fleshy, bodies may be discharg'd, and yet that the intestines are not ulcerated, for this reason, because these bodies often seem to be what they are not; I have fear'd now and then, lest you should, perhaps, wonder, that I do not seem to think an erosion, or rupture of vessels to be prov'd, even from the mere discharge of blood; so that an ulceration, either already form'd, or at least begun, must of course be acknowledg'd. But if you have wonder'd, you will immediately cease to wonder, when you attend to those things that I shall touch upon in a few words.

There is an observation of the celebrated Wagner (*e*), in which, he not only describes several appearances found by him, in the viscera of a dysenteric woman, and amongst these, that which ought to be remark'd in favour of Spigelius (*f*), "that the gall-bladder was turgid," but this also, in particular, that the intestines had, no where, any marks of disease, except that all "the small and large intestines were equally strip'd of the mucous humour, with which they are generally cover'd," and the rectum was gangrenous. But if he had observ'd any little ulcer in these parts, he then should not have look'd for the passages of the blood, which the patient had discharg'd, in those extreme orifices of the veins, that is to say, those which the scirrhus glands in the mesentery, and spasms, had constring'd, so that the blood "regurgitated immediately" through those orifices, into the intestines, in the same manner as a blue liquor, injected into the same veins, did then exhibit to him, "very evident marks of a blue sweat," within the intestines.

Besides, there is an observation of Wharton, given by Glisson, in his treatise of the stomach and intestines, which, as it is describ'd somewhat differently from the intention of this treatise, in the Sepulchretum (*g*), without referring you to any particular part of it, will, if you read it in the twenty-third chapter, under number eleven, show, that after an "enormous vomiting of blood, from poison, no vein in the stomach," which, even after death, contain'd a small quantity of blood, "had appear'd to be either ruptur'd or erod-

(*c*) Vid. Comment. de bonon. sc. acad. t. 2.

p. 1. inter medica obs. 2.

(*d*) Aët. n. cur. t. 1. obs. 195.

(*e*) Eph. n. c. cent. 1 & 2. obs. 171.

(*f*) Vid. supra n. 15.

(*g*) L. 3. f. 8. obs. 7. in additum.

“ed, but that the internal coat being wip’d away with the back of the knife, “innumerable little bloody points had then gradually appear’d, on the de-
“terg’d surface.” But whether by a wiping of this kind, as Glisson thinks, a kind of cuticle, as it were, was abraded, and the poison acted in no other manner in the living body, as the internal coat itself was seen to be bloody, just as the cutis appears when the cuticle is abraded; or whether it be more probable that the extreme orifices of the arteries being dilated, by the quantity of blood, which the violence of the poison had brought together, had, a little before, pour’d out the blood, and the back of the knife, at that time, pressing out whatever blood remain’d in them, brought their orifices to view, I would rather choose you should judge, from what Boerhaave (*b*) has said, in more than one place, of anastomosis, than that I should determine.

Attend to the example which he there produces, and elsewhere also; as, for instance, when speaking of the menstruous blood, which was retain’d, being discharg’d by other passages, he says (*i*), “I have seen an hæmoptoe of “this kind, which had grown habitual, so that every month a florid blood “was spit up, without detriment to health, though join’d with a slight cough. “I have seen the blood thrown up by vomiting: I have seen that it has been “discharg’d by stool, and by sweat.” Compare, moreover, with each of these, the other examples, that the very learned Haller (*k*) adds, in a considerable number; and in whichever you find this to have happen’d, “without detriment to the health,” suppose it to have happen’d equally, without ulceration, just as when blood was discharg’d by sweat, you would have seen the skin, in that place, to have been very found, nor any other appearance thereon, when deterg’d, but “those innumerable little bloody points,” which Wharton saw on the internal coat of the stomach, when wip’d.

Now transfer these reasonings from the stomach, to the intestines, and you will conceive how blood may be discharg’d, in a dysentery, without any ulceration of the intestines, or, if you are a little in doubt on this head, put that observation of Wharton out of the question, at present, and besides the examples which I have given you, call to mind that of blood flowing from the nostrils. Are the veins, or arteries, always either ruptur’d, or corroded, in this case? or is the coat of the nostrils always ulcerated? If they are ruptur’d or corroded, how does it happen that the blood often stops spontaneously, without the least remedy being apply’d? If they are ulcerated, how does it happen, that no pus, I do not say, but that even no pain is the consequence? Now then suppose it probable, that the same thing may happen, on the internal coat of the intestines, which you suppose to have happen’d on the internal coat of the nostrils, especially as the fluids, that are injected by the arteries, are so easily carry’d through either of these coats, into the cavity of the nostrils, or intestines (*l*). Suppose, therefore, that the quantity of blood is increas’d, that the impetus of it is increas’d, and that the extremities of the arteries, on the internal surface of the intestines, are made more lax than usual, and particularly in those in whom they were, before, naturally lax,

(*b*) Prælect. ad instit. §. 707. 775, 814, &c.

(*i*) Ad §. 667.

(*k*) In not. ad cit. modo §.

(*l*) Vid. not. Haller. ad §. 497. earund. prælect.

either from a kind of paralytic affection, or from some other cause, as for instance, from having been too much moisten'd, in fluxes of the intestines; and you will easily conceive with Boerhaave, that blood is discharg'd from thence by means of anastomosis.

24. And you must not suppose any one of these circumstances only to take place, but many of them at once. For as Boerhaave thus teaches (*m*): "when the blood cannot pass through the vena portarum, and its branches, then pure blood itself may be extravasated by anastomosis, from the mesenteric vessels," if he had not immediately added "the orifices of which are dilated," any one might doubt upon the event, who had read that Ortlobius (*n*), when he made a ligature upon this vein, in living dogs, "could never observe that pure blood burst forth on the intestines, notwithstanding the whole coat of the intestines was dy'd, as it were, with a scarlet colour." In these dogs, without doubt, the mouths of the vessels were not dilated. But they were very considerably dilated, by reason of the laxity of the surrounding fibres, "in the sphacelated intestines" of that count, of whom this author speaks; for in the intestines of this gentleman he saw, "the meseraic veins having their orifices open, and fill'd with coagulated blood, as if they had been fill'd with wax." And these things I hinted, because in a dysentery, "sometimes there is a true inflammation, and a fatal gangrene follows," as Boerhaave has said a little after those things that I have related (*o*). And indeed the observations of many authors, in this eleventh section of the Sepulchretum (*p*), show that he has said what is true; and besides that which is produc'd above (*q*), this other of Valsalva's, also, confirms it.

25. A woman died of a dysentery. The intestines were found to be inflam'd. The left kidney was altogether deficient in this woman: but the deficiency was supply'd by the right, which was twice as large as it naturally is, and furnish'd with a double pelvis, and double ureter. And both of the ureters went to the right side of the bladder.

26. Setting aside those appearances which, as it is evident to you, must have existed from the original formation of the woman; the inflammation of the intestines relates to the dysentery. Now then call back to your memory, and join with this observation, and with others, that which I have describ'd above from Piccolhominus (*r*). For in that, whether the abrasion, which seem'd so far surprizing to the observator himself, was very great; or rather, whether a considerable inflammation of that kind was join'd with the abrasion, so that the whole coat of the intestines was red, as it was in the dogs of Ortlobius (*s*); there is no doubt but Piccolhominus, also, acknowledg'd an inflammation. And as this cannot happen, but the passage of the blood, through those branches of the vena portarum, must be suppos'd to be impeded; I have already said (*t*) what may be the natural consequence of this, if any other cause be added, even before the intestines, by the impetus of the blood still continuing, begin to degenerate into a gangrenous laxity.

(*m*) Ad §. cit. 814.

(*n*) Hist. part. & œcon. hom. diff. 8. §. 7.

(*o*) Ad §. 815.

(*p*) 3. 9. 19. §. 1 & 2.

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(*q*) N. 14.

(*r*) N. 20.

(*s*) Supra, n. 24.

(*t*) Ibid.

Thus Brunnerus (*u*), in a soldier, who had been carry'd off by very violent convulsions, which came on, when he already labour'd under a diarrhœa, found through the whole tract of the intestines, and especially the smaller ones, a considerable inflammation, from which even the stomach was not altogether free, and, at the same time, coagula of blood in the last-mention'd cavity, and in the intestines a red mucus, which was a very evident proof, that the diarrhœa had, already, begun to degenerate into a dysentery, although as yet nothing gangrenous appear'd in these viscera. And an inflammation of the intestines may easily pass over into a gangrene, and even into a sphacelus, as I have said: from whence it probably happens, as was related to me, by a very experienc'd physician, when I was a young man, that it is not uncommon for the fever, in dysenteric patients, to seem to be quite gone off, for a few days before death, so that a physician, if he did not attend to other symptoms, might be shamefully deceiv'd. However, in regard to that very fallacious disorder of the intestines, the sphacelus, I shall have a more convenient opportunity of treating of it hereafter (*x*).

Now in respect to membranes being discharg'd, either together with blood, or together with pus, or with neither, and these either in a dysentery, or when there is no dysentery, somewhat is to be added to those things that I have said above. Without doubt I have wish'd, that the nature of some of these membranes might have been examin'd into, more accurately. Lenti- lius (*y*) for instance, has exceedingly well determin'd, what intestine it was, from whence the membranes proceeded, which were excreted in the stools at intervals, with or without blood, and in a greater, or in a lesser number. But as to his supposing these membranes to be the valvulæ conniventes, every one is at liberty to give credit, or not give credit, to his supposition; and even to believe, or disbelieve, this very circumstance also, that they were real membranes. For it appears that he was absent from the patient, and could have seen nothing else, but that they were "of a different size, and that, " when dried, they resembled the pellicles of a hog's bladder, when shrivel'd up with heat."

But Jo. Maurice Hoffmann (*z*), when he examin'd very attentively mem- branes that were excreted by another woman, which every other person had taken for the internal coat of the intestines, found them to be a viscid mucus, "coagulated upon the valvulæ conniventes, and condens'd into the form of "a membrane:" nor does the opinion of the celebrated Trælingius, in the fifth volume of the *Acta Naturæ Curiosorum* (*a*), differ from this: for he, on examining a kind of tube, or sheath, discharg'd by the wife of a peasant, found it to be not really membranous, "although it resembled the figure "of the colon, with its valvulæ conniventes." On the contrary, Apinus (*b*) made not the least doubt, but the membranes, which were discharg'd by another patient, were really pieces of the internal coat: and indeed he has produc'd many reasons, even from the inspection of them, why he should be believ'd: although the reason which he gave in the first place, that they were

(*u*) Exercit. de gland. duoden. §. 4.

(*x*) Epist. 35.

(*y*) Eph. n. c. dec. 3. a. 3. in append. n. 6.

ad obs. 68.

(*z*) Dec. ead. a. 9 & 10. obs. 60.

(*a*) Obs. 126.

(*b*) Dec. cit. a. 9 & 10. obs. 179.

"of a form exactly tubular," is not only render'd of no effect, by the observation which was just now quoted, but also by the observation of the celebrated Verduffius (*c*), who having examin'd, very closely, one discharg'd by another patient, found it, very evidently, to be nothing else but "a fistulous pituita, which had concreted together, and accommodated itself to the figure of the intestine, wherein it was contain'd."

But must we suppose, you will say, that the same thing happen'd within the intestine cæcum, which Beckerus (*d*) almost affirm'd formerly, his having seen discharg'd by stool; that is to say, "a membranous body, equal in length, and breadth, to the finger of a large man, open, and eroded, at one end, and at the other end shut? For he has immediately subjoin'd the following words, "made up of a threefold coat, thin, fleshy, and rugous." Nay, and to go farther, what shall we say to three other observations, in which not the appendix vermiformis, that is on the side of the intestine, for instance, but a considerable part of the tube of the intestines itself, is said to have been discharg'd by the anus? I heartily wish that George Francus (*e*) had been permitted (for his patient did not survive, as those of Beckerus, and others did, but died a few hours after the discharge of it) to examine the body, after death, in order to determine the situation, from whence, "an entire part of the small intestines, of the length of a span, and what was more, with a portion of the mesentery, still annex'd to it," had been torn away, which he, by reason of the valvulæ conniventes, wherewith it was internally furnish'd, suspected to be from the jejunum: although if a separation of this kind is to be wonder'd at, the coalition, which we must, of course, suppose to have taken place, in two other patients, betwixt those parts of the intestine, from whence the intermediate portion was torn away, is still more to be wonder'd at, since neither of these persons, if a passage had been left open, from the intestines, into the cavity of the belly, could have surviv'd.

But Jo. Peter Albrecht (*f*), and Andreus Westphal (*g*), when they produc'd their histories, ingeniously imagin'd, that an intussusception had preceded, or a prolapsus of the inverted part of the superior intestine, within the part next below; so that a tearing away of the prolaps'd part did not happen, by means of inflammation, and gangrene, before there was some conglutination in the place of the separation, betwixt the receiving, and the receiv'd intestine. For as to that which was discharg'd, being actually a portion of the intestine, although "many doubted" in regard to the first observation, and in regard to the second Bruckmann, and Hoffmann, suppos'd it to be, either only a coat of the intestine, or a mucus in the form of a coat; yet witnesses of the first being really so were not wanting, and other learned men, and in particular the magnificent order of physicians at Gripfswald, to whom what was discharg'd, in the second observation, is said to have been sent to be examin'd, have pronounc'd that to be real.

(*c*) Ephem. earund. cent. 1. obs. 90.

(*d*) Earund. dec. 1. a. 4. obs. 68.

(*e*) Earund. dec. 3. a. 5 & 6. obs. 177.

(*f*) Dec. ead. a. 3. obs. 129.

(*g*) Disput. quæ partem intest. jejuni, &c.

One thing I have observ'd, which may seem to correspond but indifferently, in either of them, to the suppos'd intususception. For the valves, in the inverted intestine, should have been found not on the "internal" surface, as they suppose, but on the external surface, nor should any portion of the mesentery, or omentum, adhere "externally," but internally: although it may be said, that the surfaces were not spoken of, as they then were, but as they had been before, in their natural state, or that the intestine had been turn'd back into its former state, either while it was carry'd down, through the remaining part of the canal, quite to the anus, or while it pass'd through the streight passage of the anus itself, or at length, even by the hands of those who had examin'd it after it was discharg'd. Be this as it will, when you have read, and consider'd, all these circumstances, you will judge what credit is to be given to these observations: for in regard to me, you are quite at your liberty, to take part either with those who believe, or with those who doubt, or with those who, in some measure, consent therewith; and I suppose you will be less surpriz'd hereafter, if you hear that any dysenteric patients have recover'd, even after they have discharg'd real membranes, or caruncles, from the intestines.

27. Although I have written much more upon the subject of the dysentery, than I had determin'd in the beginning, yet before I come to a conclusion, I have a mind to add something on the subject of tenesmus; not in the manner I see it is here done in the *Sepulchretum* (*b*), where it is consider'd as arising from other causes, of which I shall speak on a future occasion, but only when it is brought on by the dysentery. I believe, indeed, that in the end of this flux, the cause by which the rectum is irritated to discharge its contents, does frequently not consist in the disorder of the same intestine, but proceeds from the remains of the acrid mucus, and blood, stagnating in the nearest cells of the colon, especially if there be the obsolete colour of this blood mix'd with the mucus, and it being carry'd down, by degrees, through this intestine, and, in like manner, through the rectum, to the lower part of it, which is very impatient of irritation.

It is surprizing to consider how long some substances, even when in small quantity, nor in themselves viscid, seem to have been retain'd in the cells of the colon. Inquiry was made of me, in the year 1744, in the name of a learned, and ingenious, physician, where I thought that pease could possibly have remain'd in the belly of a man, five whole months after being eaten? For he asserted, that there was a man, in his city, who having eaten them frequently, and in large quantities, in the month of June, and being seiz'd in October with a dysentery, and singultus, could not be cur'd of these disorders, till, in the beginning of December, he had discharg'd by stool, two pounds of pease, which were so entire, that many of them were preserv'd as curiosities by admiring physicians. And it was said that the same thing had happen'd to the father of this man before, only they had not remain'd so many months. I answer'd, that if this relation were true; for as the story was well-known in that city, and testify'd by many, I could not fairly dispute the truth of it, especially as I had read histories, in medical authors, which

(*b*) *Obs.* 29. & seq.

were much more difficult to be suppos'd; and if these two men had the same structure of the stomach, and intestines, that others had, I did not see how they could so easily have adher'd, as by being dispers'd into many cells of the colon: for if they had been join'd together, they would have obstructed the passage through this intestine, and still more through the small intestines, and would have been very burdensome, and uneasy, to the stomach, as they were in so very considerable a quantity, and, as appear'd from the circumstances, unbroken with the teeth, and perhaps not sufficiently boil'd before, nor in a green, and tender state, but already grown old, yellow, and hard. That these cells probably were, in these men, naturally somewhat larger than they are in others, and consisted of more lax fibres, but that there was scarcely any doubt of very viscid, and tenacious, matter having been contain'd in the tube of the intestines, in considerable quantity, and that in consequence of their being accusom'd to masticate their food so little; and that the peas being entangled by this matter, and glued, as it were, to the parietes of the cells, had remain'd in this state of adhesion, till they were, at length, loosn'd, and remov'd, from thence, by the tormina of the dysentery, and the frequent strainings to stool.

28. But although in explaining that tenesmus, which succeeds a dysentery, I am often, as you have seen, so far of opinion with Sydenham (*i*), that I do not allow of an ulcer existing in the rectum; yet do not imagine that I so far adhere to his opinion, as not to fear sometimes, lest an ulcer, or some other considerable disorder, should be the consequence of a dysentery; as I was warn'd, even when I was a young man, by the event of a certain pain in that intestine, after a dysentery, upon the cause of which my preceptors had opinions different from each other.

For as in a woman of the first rank, a dysentery had ceas'd, of itself, after about fifteen days, and she always complain'd of a pain in the lower part of the intestine, when she had occasion to go to stool, and at other times also, join'd now and then, with a kind of troublesome pricking; one of them suppos'd that this arose, as it was in a delicate woman, only from a slight abrasion of the internal coat; and the other, that is Albertini, who observ'd a continual sense of weight to be join'd with that pain, besides a fever, not without a kind of consent in the thighs, and the lower part of the loins, but no tenesmus, or scarcely any; was afraid of something of greater consequence, till at length her fever, being increas'd, with a rigor, he openly foretold the speedy appearance of an abscess. Which prediction was soon confirm'd by the event, pus being discharg'd to the quantity of two ounces, and the physician who had dissented, as he was an ingenuous old man, not only confessing it, but what few can submit to, even commending the true prediction of the other.

But in regard to a very considerable disorder of the same intestine, and one that is less known among the common people, I shall have occasion to speak of it in the next letter (*k*). Farewell.

(*i*) Obs. med. circa morb. acut. f. 4. c. 3.

(*k*) N. 6. & seq.

LETTER the THIRTY-SECOND

Treats of Costiveness and of the Piles.

THE opposite disorder to that of which I lately wrote to you, I mean the disorder of costiveness, I have observ'd in many persons, without any evident detriment to health, notwithstanding some are accusom'd to have no discharges from the bowels, for weeks together, and even (as our celebrated Zeviani (*a*) has also observ'd) for a month together, and at other times, and that more frequently, join'd with manifest injury, of which death itself was the consequence. Nevertheless, I have but one observation of this disorder, which is join'd with a dissection, to describe to you here: for the other observations of this kind, as they were join'd with vomitings, volvulus, and other disorders of that kind, it did not seem proper to disjoin from them. And if the same thing were, likewise, done in the Sepulchretum, the observations of this thirteenth section would be greatly reduc'd in their number.

For you will see it remark'd in most of them, in what other section that part of the observation may be read, that has been taken away from this. But that there are others, in which the same remark ought to be made, three pages only, the hundred and ninety-third, the hundred and ninety-seventh, and the two hundred and third, if you turn to them, will clearly demonstrate. For if you read in the first, the second article of the third observation, you will naturally suppose that it belongs only to that place. But the third article will immediately show you, that the same is given twice over, and still more, that what is deficient in both, is to be sought for elsewhere, that is in the eighth section of this book, in observation the fifteenth.

A similar repetition will be prov'd, in the second of those pages I refer'd to, by comparing the second article, of the ninth observation, with the eighth article of the same; for we are not to suppose, that because by a shameful typographical error in the letter it is said "in the left side under the region of the liver:" the case is not the same which in the former is properly describ'd, by saying, "in the right side," for that it is so, will be clearly demonstrated to you, by turning to the next, that is the fourteenth section, which is there refer'd to, and in which this history is given, somewhat more at large, under article the first of the eighth observation.

Finally, the third of those pages that I pointed out, will immediately show what is repeated, and what is nevertheless omitted, when you shall have

(*a*) Del Rato, &c. l. 2. c. 11.

compar'd article the ninth of the twelfth observation, with article the third, and both of them with the seventh section, to which you are in the letter desir'd to turn, where you will read the case describ'd more at large, under observation the thirty-third.

But let it be sufficient to have pointed out these repetitions, which are so near one to another. However out of the more distant ones, that I leave to be enquir'd into by you, I cannot help taking notice of one, which, by reason of the usual little arts, and deceit of Blancardus, is not very easily detected. Read, I beseech you, the sixth article of the first observation, and compare what Formius has related of the shoemaker, with those things which, in the third observation of the additamenta, Blancardus has said of the porter: and you will perceive that the history is the same in both places; but that the shoemaker of Formius was chang'd into a porter by Blancardus, that the trick might not be found out. And if in writing to you I frequently detect artifices of this kind, of which he has been guilty, I do it for this reason, that you may withhold your assent, when you shall read in the writings of an author, in other respects, learned, that Blancardus, indeed, "in his *anatomia reformata*, had been guilty of plagiarism which was scarcely excusable . . . But that the *anatomia practica rationalis*, of the same author, "deserv'd a greater share of praise," that is to say the very book, from which those examples, that I produce to you here, are transfer'd into the Sepulchretum.

2. And yet other histories were not wanting, which related to this section, whether they were to be taken from the Sepulchretum itself, or elsewhere. For example's sake, our Saxonia (*b*) saw a smith in this city "who after a long suppression of stools, and great pains of the belly, partly by the use of acrid glysters, and partly by the use of other remedies, discharg'd many small stones of the bigness of a filbert, of a yellow colour, and so extremely hard, that they could scarcely be broken by violence." And this observation might have been very properly introduc'd in this section, and it would have been more particularly suitable in that place, where (*c*) costiveness is deduc'd from calculi of the gall-bladder; or if they should seem to be too hard, and large, to be refer'd to that class; although the biliary canals are sometimes found to be much dilated; yet in this section, at least (*d*), a calculus, of the bigness of a chestnut, which adher'd to the colon, is suppos'd to be the cause of a costiveness of the same kind, or as a great number of other observations which were already explain'd, pretty much at large, in other sections, are repeated in this; why is that wonderful history (*e*) of the maniacal man omitted here, who, though he devour'd every thing he met with, nevertheless sometimes discharg'd nothing from his belly, which was very tumid, for fifteen or sixteen weeks together? or not to digress far from this subject, as among the examples here produc'd of infants, who being born without any aperture from the rectum, could of course discharge nothing by that way, the observation of Holtzach (*f*), taken from one of them,

(*b*) Prælect. pract. p. 2. c. 19.

(*c*) Obf. 12. §. 2. 3. 7. 8.

(*d*) Obf. 9. §. 4.

(*e*) L. 1. f. 9. in addit. obs. 1.

(*f*) Obf. 11. §. 6.

who discharg'd the excrement of the bowels, by the penis, is repeated from the next section (*g*); why is another similar one omitted, which had been there produc'd (*h*), from Hildanus, or two of Mœbius (*i*), the first of which is very much like those, and the second relates to a little girl of six months old, who discharg'd the abdominal fæces through the vagina?

3. Of this last kind is the observation of my fellow-citizen Mercurialis (*k*), which is very much celebrated, if any other observation is, among the medical writers Daniel Sennertus (*l*), Thomas Bartholin (*m*), Johannes Rhodius (*n*), and others. But it is surprizing that Rhodius who resided thirty-seven years at Padua, collected his observations here, and publish'd them in the year 1657, did not enquire what had become of that same "daughter of a Jew, who went under the name of a German" whom Mercurialis saw "in this city," and who, being born without any natural passage from the rectum, "discharg'd her fæces by the vulva," and nevertheless, contrary to what might be expected by some, "surviv'd."

However as Rhodius was not ignorant, from a similar, and equally celebrated observation of Benivenius (*o*), that another girl had not liv'd beyond her sixteenth year, he would readily suppose that this Hebrew girl also, had perhaps died the same kind of death, not many years after Mercurialis had seen her, (and he had seen her before the year 1583), that is, had died from an excruciating pain of the intestines, probably from the excrements being, at that time, much indurated, and become so thick, that they could not be discharg'd by a passage which was not natural to them, nor yet perhaps proper to convey emollient, and lubricating, clysters commodiously to the intestines. But whether in the girl of Benivenius, this happen'd the more easily, because she had no discharge by stool, more than once in eight days; or whether the Paduan Jewess was more fortunate, Rhodius would certainly have found, had he enquir'd, that she was alive even then, and had pass'd her seventieth year, (and not only, as a certain girl whose history is given elsewhere (*p*), of twenty years of age): and indeed she even surviv'd Rhodius by many years, inasmuch as she, which is a very rare instance even among those that are most healthy, liv'd a whole century, as was testified to me, by one who had sometimes attended this old woman, as a physician, I mean Isaac Cantarini, when in the year 1719, he happen'd, as he was a learned old man, to be talking with me of Mercurialis. But she always bore up under her misfortune with patience, and without attempting to relieve it, well-remembering the advice that was given to her father, by Mercurialis.

And there is no doubt but where another passage is open'd by nature itself, through which you may make a sufficient discharge of the excrementitious matter, the inconvenience is to be prefer'd to the many and various dangers, which, unless necessity itself compels, are by no means to be enter'd into, or at least not from the advice, and countenance, of a prudent man.

(*g*) Obs. 24. §. 1.

(*h*) §. 2.

(*i*) Obs. 22.

(*k*) De morb. puer. l. 1. c. 9.

(*l*) Medic. pract. l. 4. p. 1. f. 1. c. 1. in fin.

(*m*) Cent. 2. hist. 63.

(*n*) Cent. 2. obs. 91.

(*o*) De abdit. morbor. caus. &c. c. 86.

(*p*) Eph. n. c. dec. 2. a. 10. obs. 75.

For unless the aperture of the rectum at the anus, be found to be shut up only by a membrane, so that by an easy and safe incision, an exit may be given to the excrements, that are urging from above, as the dissection of a little boy, describ'd by the celebrated Baverus (*q*), shews might easily have been done, an incision undertaken rashly will frequently hasten the death of the infant, and will make that remedy infamous and horrible, which would otherwise be advantageous to many, if prudently made use of. For suppose that the rectum has, in the whole extent of it, no passage at all, but is solid like a rope, as the eleventh observation, in this part of the Sepulchretum, describes it (*r*); or suppose, to omit examples of other disorders, that the whole of that intestine is wanting, of which you will find an observation in the same place (*s*). Is not the success of the incision, which you read there, the same with that which you read of in Schenck (*t*), when in the daughter of one Sichard an apothecary, the surgeon attempted the dissection indeed, but “did not find the rectum?” As another surgeon did not, in like manner, who perforated “to the length almost of the little finger,” in one of those infants, I mean, whom Ruych found to be entirely without that intestine (*u*).

Nor indeed are instances of this kind very rare; for the celebrated Heister (*x*) has affirm'd it to have been seen more than once by him also, and has describ'd one example fully (*y*): nor are we without another, besides these, which you may read elsewhere, though taken notice of by the celebrated Hoyer (*z*) only *en passant*: and indeed that sometimes happens, likewise, which may easily deceive the operator, that is to say, the lower part of the rectum is not wanting: for by introducing the finger per anum, for some little space, which is sufficiently pervious, he naturally conceives a hope of a successful incision, as if nothing but a kind of membrane, which was interpos'd, cut off the communication with the upper part of the rectum, and yet this remaining part is in fact no-where; but the other rectum is an intestine, which being full of feces, is infected at a considerable distance from the anus, to the upper part of the os sacrum, and being shut up, and firmly concentered to that part, terminates there, as has been seen by the celebrated Peter Christopher Wagner (*a*).

It is true, I should not always blame the surgeon, if an infant die on the day after the incision has been made, as that did whose two little brothers had, also, been born with an imperforated rectum (*b*). For although I have read, that a great number of other infants, who were affected with the same præternatural disorder, have liv'd seven, ten, twelve, or more days; yet I have also read that some, in other respects healthy, and who had not undergone the least incision, did not live more than three days.

However, unless it appear from dissection, that the chirurgical operation has not been the cause of death, he, in particular, will not escape all suspi-

(*q*) Act. eorund. t. 4. obs. 147.

(*r*) §. 4.

(*s*) §. 17.

(*t*) Obs. medic. l. 3. ubi de intestino recto

obs. 6.

(*u*) Advers. anat. dec. 2. c. 10.

(*x*) Inst. chirurg. p. 2. f. 5. c. 163. n. 1.

(*y*) Eph. n. c. cent. 3. & 4. obs. 193.

(*z*) Earund. cent. 6. obs. 59.

(*a*) Commenc. Litter. a. 1735. Hebd. 46.

n. 4.

(*b*) Eph. cit. dec. 3. a. 5. & 6. obs. 282.

cion of having hasten'd the death of the infant, who, without properly considering every circumstance, has run headlong to the incision, as if to a remedy that was not at all dangerous. Wherefore, when any other passage is sufficiently open'd, although attended with great inconveniencies, and it is not certain that the rectum comes down so far betwixt the buttocks, that its canal is cover'd only with the cutis, or a membrane of no great thickness; we must not search, in that part, for what perhaps terminates in another place, as for instance, in the upper part of the vagina. For unless the incision penetrate thus far, it can have no effect in removing the complaint; and if it does really penetrate thus far, two other dangers remain behind, besides that of hæmorrhage, or convulsions, one of which is, lest the passage open'd by nature, into the vagina, may never be quite clos'd up, notwithstanding the incision; and the second, lest that which is open'd artificially by another way, should from the want of a sphincter, to shut up the orifice, not remove, but double, the inconvenience.

4. But if there be no exit at all, to the abdominal fæces, a doubtful method of cure ought to be prefer'd to the certain death of the infant. For nature has not dealt with other animals, as she has with that insect, which is call'd by the French *Fourmi-lion*, and which according to the observations made upon insects, by that incomparable natural historian Reaumur (*c*), has neither any anus, nor any intestinal excrements that can be perceiv'd. And if the cow at Perinthus, of whom Aristotle (*d*) deliver'd down in writing, what he had heard, had no external aperture to the rectum, "in which
" the excrementitious part of the food being attenuated, was discharg'd
" through the bladder, and the anus being cut asunder, very soon clos'd
" up again, so that the disorder could not be obviated by repeated incision;" I have no doubt but I may suspect, with some probability, that the last intestine terminated in the bladder; and the useless incisions confirm what I just now said, of the difficulty either of penetrating so far as there is occasion, or of shutting up a passage, which has been open'd by nature.

And I had the same suspicion formerly, when I heard that there was a virgin at Bologna, who discharg'd nothing by the intestines, but all by the bladder, dissolv'd in the urine. For that this intestine has, more than once, been inserted into the bladder, three observations, which you have join'd together in the Sepulchretum, testify (*e*), or at least two, if the third is the same as the first, which this twelfth section, being quoted in the former (*f*), seems to shew. But if none of those infants, that are describ'd in these observations, surviv'd; the cause of their death is, perhaps, to be ascrib'd, if not so much to the very narrow communication betwixt the rectum, and bladder, such as is describ'd, and delineated, by the celebrated Sandenius (*g*), yet at least to the narrowness, length, and winding, of the male urethra, which is, for these reasons, unequal to the task of discharging the urine for a long time together, as it is now very thick, on account of the excrements being mix'd with it (*h*).

(*c*) Memoir. pour. l'hist. des insect. t. 6. mem. 10.

(*d*) De generat. animal. l. 4. c. 4. in fin.

(*e*) L. 3. f. xi. obs. 24. §. 1. 2. 3.

(*f*) Vid. obs. xi. §. 6.

(*g*) Eph. n. c. dec. 3. a. 9. & 10. obs. 194.

(*h*) Vid. tamen epist. 65. n. 6.

Be this as it will ; as often as ever it appears, that no passage is open for the discharge of the fæces, from the intestines, we must not delay, till the long retention thereof, begins to be very injurious to the infant ; and, for that reason, renders it less fit for the operation ; but the cure must necessarily be attempted, having first declar'd to every one about the infant, the doubtfulness of the event ; yet the attempt must be always made with caution, and with skill, lest by one who is ignorant of anatomy, the bladder, or, in females, the vagina, be wounded, together with the other parts, especially where the instrument must, necessarily, be introduc'd very high up.

For besides a very thick membrane, a spongy flesh, sometimes, and fat, to the extent of two inches, may be interpos'd, as you will learn from the Sepulchretum (*i*), and even sometimes, as you will read in the same place (*k*), the internal coalition goes up so high, as to equal the length of "two joints" of the little finger, of a moderately-siz'd man ;" and yet the child, "having lost but little blood," in the perforation, and a proper cure having succeeded, was preserv'd, so that being at length "an old woman," she died, as it seems, of quite a different disease, which you will learn from reading in another place (*l*), the conclusion of that observation, which is very improperly omitted there. And you will find that another liv'd till it was four years of age, and is perhaps still living ; I mean one whom Hoyerus (*m*), that I have commended above, cur'd by an incision, longer than the "joint of a man's thumb:" to take no notice of that, which the celebrated Huberus (*n*) shows it possible to have sav'd, if the father of the infant had suffer'd the *carneo-pinguedinous* mass which he saw in the dead body, and which had been already cut through with the knife, in the living body, "to the extent of almost two fingers breadths," to be cut a little higher ; for by this means, the incision would have reach'd into the cavity of the intestine, that terminated close to it.

5. But, although this kind of disorder may sometimes be cur'd, even when there seems scarcely any hope of a cure, many of them are, nevertheless, absolutely incurable, as when there is an occlusion, or adstriction, in some one of the higher intestines, of which case you have instances not only here in the Sepulchretum, but will also have other instances from me, at other times. And to these you will add, not only the large fleshy excrescence, said, in the preceding letter (*o*), to have been found within the colon, by Cortesius, but also the scirrhus ring, made up of glands, which the celebrated Haafius (*p*), found in the same place, and which left a foramen scarcely sufficient to admit a slender probe ; and, in like manner, the callus of the same intestine, which was almost cartilaginous, and which the celebrated Christian Wencker (*q*) describ'd, from the observation of his brother, as rendering the tube, in that part, extremely narrow ; nor must that be omitted which is describ'd by Laubius (*r*), of the colon, before it came near to the rectum, having its coats so contracted in a great part of the tube, as to render it not at all surpris-

(*i*) Obs. cit. xi. §. 14.

(*k*) Ibid. in schol. ad §. 4.

(*l*) Eph. n. c. dec. 1. a. 3. obs. 257.

(*m*) Obs. 59. cit. supra, ad. n. 3.

(*n*) Aët. n. c. t. 8. ob. 24.

(*o*) N. 21.

(*p*) Commenc. litter. a. 1742. hebdom. 45.

n. 2.

(*q*) Diff. sist. virgin. ventric. perforat. §. 5.

(*r*) Eph. n. c. cent. 7. obs. 41.

ing, that the fæces could not descend; and still less must we omit the same disorder, when it is, at the same time, extended to the greater part of the rectum, such as was seen by Waltherus (s), who was, when living, a very experienc'd man. And not to quit the subject of this last intestine, external compression is often the cause of an incurable coarctation therein.

Thus in the case given under the eleventh observation, of this section of the Sepulchretum (t), by whom could it be well-known, that a kind of glandular tumour compress'd the upper part of the rectum, on both sides; and I may, with much greater propriety, perhaps, say, by whom could it be cur'd? And I do not doubt, but the coalition of this intestine is to be deduc'd, rather from a tumour of that kind, than from "some very hot medicines (u)," which had been taken, and which would dry up, and contract, the intestine, just as fire is wont to dry up membranes; provided, however, that the coalition was really in the rectum, since a portion of a wax candle was introduc'd, as Donatus says, "to the length of a foot and a half;" for how this could happen in any man, I do not see, unless the candle was drawn away in an inflected state, or unless the intestines were differently dispos'd, from their usual, and natural situation. But let the coalition have been wherever you please to suppose, that it is to be accounted for, rather, from the cause which I have mention'd, than from any different cause, another history of the same coalition, which is transfer'd hither from Tulpus, will demonstrate (x).

For this author saw this intestine, of which I am speaking, so depress'd by two calculi of the urinary bladder, "that being streighten'd, and collaps'd, it produc'd many membranous filaments, which so closely interwove the internal parietes of its tube, as to prevent a possibility of its transmitting any excrement;" and in the same manner, he had seen, at another time (y), "that similar filaments had obstructed the gula, which was streighten'd by a cancer." But this coalition of the rectum was incurable, also, for more reasons than one, as you will learn from reading that observation, in the writings of Tulpus himself (z). Moreover, how much the intestinum rectum, when compress'd and made narrow, may obstruct the discharge of the fæces, even without any connection of the parietes, you will learn from other observations, which you may join to those of the Sepulchretum; as, for instance, from that of Riedlinus (a), who found, in a man, that had died of an obstruction of the bowels, "a mass partly fleshy, and partly glandular," which was larger than a fist, and compress'd the intestine, near to the urinary bladder; and in the intestine, also, were many "fleshy excrescences;" or from those of Jannellius, and Lancisi (b), who saw an obstinate, and insuperable, costiveness in a matron, from the colon, and particularly, in its lower part, being so dilated, and heavy, as to force the uterus towards the rectum, to confine it to a very narrow compass, and cause a great contraction of its canal: or finally, from that of the celebrated Hasenst (c), who

(s) Dissert. d. intestinor. angustia §. 20.

(t) §. 2.

(u) Vid. schol. subject.

(x) Obs. 14. §. 5.

(y) Vid. ejus. obs. med. l. 3. c. 1. in fin.

(z) C. cit.

(a) Vid. aët. erudit. Lips. m. jul. ubi ejus. curæ med. referuntur.

(b) Eph. n. c. cent. 10. in append. n. 4.

(c) Commenc. litter. a. 1740. hebdom. 30. n. 1.

observ'd.

observ'd many adipose appendages, hanging, externally, to the sides of the rectum, which, in their shape, resembled that of a small pear, and which, though in consequence of their softness they did not, indeed, bring on an obstruction of the bowels, "greatly prevented, nevertheless, a free discharge from that canal.

6. There is, besides, another disorder of the same intestine, of which I see that no mention is made in this section of the Sepulchretum. Ruyfch in his *Observationes Anatomico-chirurgicæ* (d), and likewise in his *Adversaria* (e); describes it under the name of "a scirrhus thickening, and surprizing coarctation of the rectum," that is to say, with its coats almost exceeding the thickness of an inch, and so much indurated, that he was in doubt, whether to call them cartilaginous, or fleshy; and with its cavity so much diminish'd, in circumference, that a slender probe could scarcely be introduc'd sometimes, nor could the fæces be discharg'd, without the most violent strainings, and that either in drops, or in a slender substance, scarcely thicker than a stalk of grass. This disorder he asserts "to happen rarely, and for that "reason, to be known to few:" nor indeed does it appear, that it had been seen by him, in more than two cases; so that he put them in the number of those, which he suppos'd never to have been seen by Bidloo (f).

I remember that Valsalva was sent for to Faenza, to a very considerable man, who, as the same symptoms demonstrated, was troubled with the same disease, or, at least, with one which was very near akin to it. I accompanied Valsalva to that place, and he told me, that the same kind of disorder had been observ'd by him, before, in others, and by dissection also, as I suppose; for I find no such thing in his dissections: but only in other papers, as far as relates to two patients, whom he saw some years after, as the cases, which he has left in writing, together with the treatment of them, demonstrate. In both of them, he refers the difficulty in discharging the fæces, from the intestines, to the glands being become much thicken'd in the rectum, and in part ulcerated; and in one of them he says that a tumour, in the form of a ring, was perceiv'd to be prominent on the inside of the intestine, about three inches above the lower part of the rectum.

I myself was also consulted, in the preceding summer, for a noble matron, who having, for many months, discharg'd the intestinal excrements, compress'd into the shape of a flat border, or fillet, and imagining that she was troubled with no disorder, but that of the piles, had been lately found to have the intestine, about the upper part of the sphincter ani, swell'd all round, to the extent of two inches, and so much streighten'd, that the point of the finger could not be introduc'd, without force, and uneasiness. As this patient had, before, been subject to tumours in the glands of the groins, and the axillæ, and likewise, to pustules, and ulcerations, and as, even at this time, some pus was discharg'd before the fæces, though not in great quantity; I readily judg'd that the same thing, which Valsalva had perceiv'd in those patients, by means of the finger, was to be perceiv'd, also, in this matron, and wrote back this opinion, in my answer to those who consulted.

(d) Obs. 95. & 96.

(e) Dec. 2. c. 10.

(f) Respons. ad Bidl.

me by letter, especially as I was led to the same way of thinking, by some observations of my own.

One of these which I still preserve, together with the dissection, I shall the more readily write to you, because I see that this disorder, or at least one very similar to it, is describ'd, as far as it could be, by observations taken from the living body, in the *Commercium Litterarium* (g), and class'd, "with justice, among those that are more rare;" but I find no anatomical inspection of the patient, who died, some time afterwards (h), of an iliac passion. And although I read, in another book (i), that there was, in a little boy, "such a disease of the rectum, as Ruysch in the ninety-fifth, and ninety-sixth, of his *Observationes Anatomicae*, describes by a twofold example, that "is to say, a disorder in which the sphincter ani was concern'd, and by "means of which, it had grown rigid all round, and contracted a very great "scirrhoty;" yet I observe that the same kind of disorder was common to the other intestines also, and this in particular, "that the bowels in the "beginning were a little costive, but after some time very lax; and that the "aliments, which had been but just taken in, were, for the most part, discharged, without the patient's being sensible of it." And for this reason I subjoin my observation which is as follows.

7. A woman who was more than fifty years of age, had fallen three years before from a hæmorrhoidal affection, as she herself said, into a much more grievous disorder of the rectum, on account of which she was, at length, receiv'd into the hospital of incurables, at Bologna, about the end of the year 1704. Valsalva having only ask'd questions of this woman, without so much as introducing his finger, to examine the rectum, immediately pronounc'd her disorder to be incurable, and, turning to me as I stood close to him, said, this is a disorder of a similar kind with that which I found at Faenza, some months ago, when you were there with me (k), that is to say, a glandular tumour occupies the circumference of the rectum here also. And this woman, although with the other symptoms of this disorder, she perceiv'd no pain, discharg'd, nevertheless, a great quantity of foetid matter, sometimes thin, and at other times pretty thick. Wherefore, being brought to the last stage of a consumption, she died within a month, or two, from her coming into the hospital, after fevers which attack'd her with a chillness.

The intestinum rectum being laid open longitudinally, and display'd, I examin'd it, and found it in the following state. At six or seven fingers breadths above the anus it began to become pretty hard, and thick, and to swell out, every where, from the surface, internally, into bodies, which, in their figure, and size, resembled very large beans. They were all smooth in their surfaces, but of a solid and compact substance. The hardness and thicknes of the intestine, and the bulk of those bodies, which were more nearly similar to conglobate glands, than to any other bodies, and in their colour also, as well as in their size, and figure, were proportionably increas'd, as you came nearer to the lower part of the canal. Yet the lower part of the intestine, as far as it could be cover'd with the breadth of a finger, was found,

(g) A. 1742, hebd. 35. §. 3. n. 1.

(h) A. 1744, heb. 2, §. 3. n. 2.

(i) Act. n. c. tom. 2. obs. 65.

(k) Vid. n. proximo superiore.

and from the very extremity of the anus hung two excrescences, at the same time that the cutis was slightly ulcerated about the anus.

8. Now in order to perceive that Valsalva's observations, and mine, differ less from those of Ruysch, than, perhaps, appears at first sight, compare them together, and you will find that the first patient of Ruysch, also, had excreted (*l*) the intestinal fæces, with "an ichorous, and purulent matter," and that the disease of the second (*m*), was, by some physicians, thought "to be the piles:" both of which happen'd likewise in most of our patients. And indeed I believe that one principal reason, amongst others, why this disorder, though, perhaps, not very rare, has been known to very few; nor has been found out, for the most part, till very late in the disease, when the finger was at length introduc'd, is that the patients, and the physicians, generally suppose no disease to be concern'd in the case, but the piles. And for this reason, in that second case of Ruysch's it was resolv'd, that they should be taken away by incision, which was even attempted, but of course without effect. And, indeed, even if that kind of disorder which I have describ'd, were of such a nature, that it could be remov'd by the chirurgical knife; yet the very seat of the disease, as it has been seen by Ruysch, and by us, is often so very high up within the intestine as to leave no room to admit of such a method of cure.

However, that ancient opinion, which is circulated together with the books of Hippocrates (*n*), does by no means escape me; I mean, that "the intestinum rectum may be cut, and repeatedly cut, may be sew'd up, may be burnt with actual, or potential cauteries, and may be slough'd away afterwards, and yet, notwithstanding these things may seem so very violent, they will have no mischievous consequences." But, at the same time, neither does it escape me, that this dogma is, by the most skilful surgeons, generally refer'd to that part of the intestine, from the more deep incision of which most of the ancient surgeons abstain'd, lest they should cut asunder the sphincter ani, and take away its power, and office, for ever. And if this fear had not been, in great measure, remov'd, by the observations of others, I could have assur'd you of my having heard Valsalva say that he, by making the experiment upon dogs, had found this sphincter, when cut asunder through the whole of its thickness, to have again recover'd its power, and perform'd its office, though not so strongly as before, and that he had observ'd the same thing, in the human body, on some occasions.

I have also read, in a certain paper of his, which was written after this time, that a man had been cur'd by him, in the year 1708, in whom an abscess, and a gangrene, that succeeded thereto, had eroded part of one buttock, together with that whole portion of the sphincter, which corresponded to it, so that the fæces were discharg'd involuntarily: that this man, though in consequence of these disorders, he was brought to the very threshold of death, had escap'd, and his ulcer being perfectly heal'd up, that the sphincter had return'd to its former state. But, notwithstanding the truth of these things, the farther you go up, above the sphincter, so much the more dangerous the incision will be, whether, some larger blood-vessel being hurt thereby,

(*l*) Obs. *ibid.* cit. 95.

(*m*) Obs. 96.

(*n*) L. de Hamorrhoid. n. 1.

you may not be able to stop the flux of the blood ; or some nerve, being prick'd, give rise to that mortal pain, which our Fabricius has observ'd (o), and which seems to have proceeded from this cause ; or, finally, whether, neither the artery, nor nerve being wounded, you only perforate the intestine, and by this means open an exit for the fæces into the cavity of the belly : for who is able to avoid these dangers, in blind and dark incisions ?

9. For these, and for other reasons, therefore, which are of themselves sufficiently manifest, when there is not room to attempt an efficacious cure, it remains that with Ruyſch (p), and Valsalva, we necessarily embrace that which is call'd *palliative*. The first commended emollients, and glysters, that alleviate pain. Nor did the other disapprove of them, unless they flow'd back immediately : for which reason, he rather recommended the injections of small quantities, and frequently, and even to bury in the rectum, as far as the patient could bear it, without uneasiness, the tube through which these clysters were convey'd, and which should be properly perforated, laterally, so as to suffer the fluid, that it convey'd, to come to the very seat of the disorder : he also, on the same plan, advis'd to use a bath of an emollient, and lenient nature, and to keep a pipe of this kind in the rectum, while the patient sat over the bath, so as to admit the fluid into immediate contact with the diseas'd parts.

However, the fluid that he recommended, to be us'd for this purpose, was different according to the different state of the disease ; sometimes he us'd lime water more or less diluted ; sometimes the water of that warm bath, which is above Bologna, and which he sometimes also gave for drink ; and, at other times, when he suppos'd there to be no ulceration join'd to the other disorders, he medicated common water, by boiling in it such ingredients, as he thought would be of most service.

So he also prescrib'd various remedies to be taken internally, and among those the turpentine-resin, after which was to be drunk a water, medicated with vulnerary herbs, (with which he sometimes mix'd this resin dissolv'd in the yolk of an egg, and us'd it for injections) ; but, sometimes, when the season of the year was very warm, he omitted the resin, and made use of water, in which the same, or other herbs, had been occasionally boiled, but in small quantity only, in proportion to the water ; so that a very free use might be made of it, almost like the warm bath waters ; and he would even have it drunk by way of common liquor : but in the winter he recommended wine at the table, and that of the domestic kind, in which, at the autumnal season, when it fermented in the cask, such roots, woods, and leaves, as he thought to be most suitable, had been macerated.

Hitherto I have follow'd the advice and example of both these gentlemen, in such a manner as to recommend some of these remedies, in preference to others, and, in general, to mix with them such medicines, as are effectual against the venereal disease, inasmuch as I have observ'd that a disorder, of the venereal kind, has been generally accusom'd to precede the disorder of which I treat ; and still less did I omit such things as I have known to be, sometimes, of great service, in dissolving hard tumours. For I believe that

(o) De chirurg. oper. c. de an fistul. in fin.

(p) Obs. cit. 96. in fin.

these ought to be us'd more frequently than those which are properly emollient, lest it should happen, that the fibres being too much relax'd, the parts yield to the matter that falls upon them, and the tumour being, by this means, increas'd, all passage for the excrements is intercepted: and, in like manner, we are to endeavour that these may be soft, lest, being hard, and large in their dimensions, they serve as an obstruction to their own exit; through a passage, which is already too narrow, or lest, if they do pass through, they should cause, by their violent compression upon the tumour, pains, and ulcers, or if there are any already, increase them; yet we must not, for these very reasons, use such medicines, in order to bring this about, as are either in themselves acrid, or may solicit a quantity of acrid humours towards that part.

10. There are two disorders, which are the consequences of that costiveness, upon which I have written to you this short letter, the one more frequently, which is the disorder of the hæmorrhoidal vessels, commonly call'd piles, and the other not very rarely, I mean the prolapsus ani. In regard to the latter, as you knew there was no section in the Sepulchretum, on that subject, it is for this reason, I suppose, that you have, so long since, earnestly entreated me to communicate to you, a long opinion which you had heard was written by me, and this, such as it is, I will send you in the next letter upon the hæmorrhoidal affection, however, there is a section in the Sepulchretum (g); but so short is it that, if you take away the scholia, it scarcely fills up half a page. For which reason I choose to add some things here, upon the subject of the piles, rather than, when I come to that section, write a whole letter upon it, especially as among the observations of Valsalva, or among mine, we scarcely find any dissections, which properly relate to these diseases. Therefore, as to costiveness of the bowels, frequently bringing on the piles, as I said just now, it is not to be doubted, and it is thus explain'd by Boerhaave (r), that in the straining necessary to discharge the fæces, "the intestines are compress'd, the arterial blood is circulated more briskly, the venous is retarded, and even stagnating in the vessels of the "intestinum rectum, putrifies, and by this means brings on a disposition to "the piles."

I am not ignorant, however, that the blood stagnates in the veins of the same intestine, from other causes also. For as the most internal of these veins, finally terminate in the trunk of the vena portarum; if it should happen that these veins, either in their passage, or in their termination, or even in this part, should be, for a considerable time, streightened, or press'd, by the convulsion, distention, or obstruction, of the surrounding parts; it is natural to suppose that the blood would, certainly, be too long detain'd in these veins: so if the mesentery be convuls'd, or if the intestines are too much distended with flatus, or if the liver be obstructed, the same thing may easily happen. And of this kind is the observation of Vesalius, which is the first, and at the same time the principal, of those three that you read in the very short section, which I just now pointed out.

(g) L. hujus 3. sect. 15.

(r) Prælect. in inst. §. 774. in fin.

For in him who had labour'd, at intervals, under a flux of blood, from the hæmorrhoidal vessels, the spleen was not the only viscus indurated, as you will perhaps suppose, from turning to the fifth chapter of the third book, *De Fabrica Corporis Humani*, from which, alone, that observation is copied in the Sepulchretum; but "the liver was surprizingly hard" also, as you will learn from the fifteenth chapter of the fifth book, where Vesalius gives the same case a little more at large, and, at the same time, you will understand, or at least in part, the real cause why the internal hæmorrhoidal vein "was equal nearly to the thickness of a man's thumb, at the extremity "of the colon, and through the whole length of the rectum;" which in his time he could not understand.

Without doubt, it was not very easy for the blood to pass through a liver of that kind. But why then, you will say, did it not stagnate, equally, in the other veins, which go to the trunk of the vena portarum? And for this very reason it was, that I said you would immediately understand it, or at least in part. Add therefore, to omit other things, the very great length, which is peculiar to this one vein among the others, so that it is much more difficult for the blood to be carry'd upwards, from this vein, than from the others, especially as the situation of the human body requires it, which, without doubt, is one of the reasons, why other animals are not subject to the piles. And if you ask why, in those bodies, in which there is any impediment to the quick motion of the blood upwards, the veins of the legs in particular are dilated into varices, you will find the same thing to be the cause, of them chiefly, which we assign for the piles.

You see, even in the Sepulchretum (s), that Walæus expressly asserts the piles "to be nothing else but varices of the veins of the anus." And you will find Boerhaave confirming this opinion, in another place (t), where he has declar'd the same things which I copied from him just now, but more at large, and without the least mention of putrefaction. And how much these veins may be dilated, I observ'd in a certain man (u) of a good habit of body, but inclin'd to be plethoric, who died at Bologna, in the year 1706, of a wound under the axilla, and whose body I dissected. The extremity of the intestine, in this man, appear'd to have been subject to the piles, as it was internally unequal with varicous knots of veins; and as I look'd upon the largest of these veins very attentively, I wonder'd that none but the smallest blood-vessels communicated with it, though itself was distended with a large quantity of grumous blood; so as to make it evident, that some very small vein had been expanded, into so considerable a size.

II. That these things therefore, may not happen, which it is well known do by no means happen, without severe pains; and especially at the time of going to stool, if these varices are really turgid, and not yet ruptur'd: or if they are ruptur'd, not without a hæmorrhage succeeding, which is sometimes immoderate, and leaves such consequences behind it sometimes, as have more than sufficiently shown us, that the piles are not greatly to be desir'd; in the first place a plenitude is to be avoided; for in men there are not passages pre-

(s) In schol. ad 1. obs. sect. cit.

(t) Praelect. cit. ad §. 112.

(u) De hoc vid. epist. 44. n. 22.

par'd by nature, for the superfluous blood to be conveniently thrown off, as there are in women, in whom it was necessary; but they must be open'd by disease, which is then sometimes salutary, but often dangerous, and always inconvenient.

In the second place such things ought to be avoided, as render the belly very costive; and I do not only mean to avoid taking in a great quantity of styptic, and astringent juices, which by crisping up the minute orifices of the glands, that moisten the intestines, and their contents, do not suffer a sufficient quantity of moisture to be discharg'd; but I speak even of the custom of eating, and especially of drinking, much more sparingly, than nature can bear. Thus we read in the life of Sarpi, that as he, when a young man, ate very sparingly, and drank nothing, even for many days, he fell into an obstinate costiveness, in consequence of which, he not only went to stool no more than once in three days generally, but sometimes only once in seven, and, in order to do that, was oblig'd to use such violent strainings, that brought upon him great pains from the piles, and a troublesome prolapsus ani, under which he labour'd for many years.

But if, notwithstanding those things, that I have caution'd you against, being avoided, and others of the same kind, the intestinal faeces still continue to be very hard, and the more frequent use of emollient food, is not of advantage against this costiveness; there is, perhaps, no remedy to be prefer'd, for preventing the piles being the consequence of these strainings, to that which I see is us'd by physicians of note, in order to prevent their being so painful, at the time of going to stool, when they are already form'd in the intestine. They inject, before the time of going to stool, an ounce of any emollient oil, and, in particular, linseed oil: which I have also been accus'tom'd to use frequently, and successfully, (when the hard excrements are to be soften'd, and the lower part of the intestine to be lubricated) nearly in the same quantity, or at least not in a much greater, lest it immediately flow back, and even that it may be for a long time retain'd: although I have sometimes prescrib'd olive oil in this manner, from the very time in which Ramazzini inform'd me, that in the case of a woman in child-bed, who, for seven days together, had never gone to stool, after a great number of different things had been tried in vain, it came into his mind, which he said, if I remember rightly, he had read in Martinus Rulandus, that two ounces of common oil should be injected every hour, and that by this means he had procur'd a discharge.

12. The mention of this remedy brings to my mind another, which I have heard was applied by an illustrious woman, who had been troubled, for a long time, with a tumefaction of the hæmorrhoidal vessels. As she came hither for the sake of consulting me, after I had examin'd them, I ask'd her, by what means she was able to put them up again as they were so swelled, without almost intolerable pain; she immediately answer'd, that she, after having made trial of a great number of things, had found nothing more useful, than the fat that lies about the kidneys of a dog, which has yellow, or redish hair. That with this fat, properly prepar'd for the purpose, she anointed the piles when they were push'd down, at the time of going to stool; and, by this means, had been us'd to push them up, for a long time, with-

out pain, or at least with much less pain than she otherwise could, from the very time that others, having made the experiment, communicated it to her as a secret.

Indeed I had before known that physicians, sometimes, made use of the fat of a dog, and not only the external, but the internal fat, yet the use of it for this particular purpose, and of that which is taken from a particular part of a particular dog, I do not remember ever to have heard of, or seen. It is much more easy to assign a cause for the utility of the two methods that I shall relate to you; for they are much more in common use, although not made use of, or at least in general, against the same disease, nor in the same manner. That is to say, I saw Albertini alleviate the violent pain of the tumid hæmorrhoids, in a certain nobleman, by applying to them the internal parts of gourds, or by injecting water in which these had been boil'd: and from another nobleman of the first rank, and character, who had lately held the office of vice-roy, when he came to me, to ask medical advice for his children, I heard, on occasion of the piles being mention'd, that flannels steep'd in warm water, in which linseed, and the slic'd roots of marsh-mallows, had, for a considerable time, been boil'd, being now and then applied to the parts, he had so far found advantage by them in this disorder, that they not only alleviated the pains, but if they were applied, immediately upon the beginning of them, did not suffer the hæmorrhoidal tumour to increase, and, consequently, did not suffer the piles to burst, and cause a considerable loss of blood.

But where this hæmorrhage was in too great a quantity, Valsalva, to return to the physicians, commended three things, in preference to others, from which it had happen'd that he had seen surprizing effects: the first, to anoint the umbilical region with fresh theriaca, in which opium has been mix'd in the proportion of four, or even of six grains, if the flux is considerable, to about six drams. The second was to apply vitriol reduc'd into a calx, which is call'd by chymists colcothar, to the part from whence the blood flows. The third, to take care that the patient should press the lower part of the intestine downwards, if perchance, as sometimes happens, the open foramen of the sanguiferous vessel may be brought into view: and then to apply a little piece of vitriol, fitted in the orifice of a pipe, as painters are wont to apply the hæmatites, to this foramen, and to continue it there for a little time, till it bring on a crust. And in this order, in which he propos'd them, he would have them be applied, one after another, that is to say, where the former had not answer'd their end.

13. And because the question is not here of new remedies, or of unusual methods of cure, but of those which, from the testimony of illustrious patients themselves, or that of grave physicians, have been found useful, and, in particular, of the method us'd by our Valsalva; I will also add this, as you desire to know it. If he happen'd to light on a patient, who was not very desirous to undergo any chirurgical operation, in order to prevent his being subject to an immoderate flux of blood, from the hæmorrhoidal veins, in the future, it was not his custom to follow, unless perhaps in a recent disorder, and indeed by another method of cure, I say, it was not his cus-

rom to follow the author of that little book entitled (x), *de hæmorrhoidibus*, which teaches us, "that we ought to leave no hæmorrhoid, or pile, unburnt, but to destroy them all by burning;" he rather follow'd the author of the sixth section of the aphorisms, who admonishes (y) "that if, in a person who is cur'd of piles, that have been of long standing, one of them is not preserv'd, there is danger that an anasarcaous dropy, or a consumption, may come on." For this he took great care of, even in curing ulcers of the anus. Thus, once when he show'd me a certain person who had labour'd, for sixteen years together, under these ulcers, and who was, even then, extremely well, though it was in the eighth year after his cure; one ulcer, said he, which was less troublesome than the rest, I purposely left untouched.

And I remember, when it was a matter of controversy whether the disorders, with which two knights, of distinguish'd rank, were troubled, were piles, or ulcers, that he immediately show'd them to be ulcers, in both of them. For in one of them, having introduc'd his finger, pretty high up in the rectum, he pointed out to the others, the certain situation of the ulcer, as the apex of his finger being receiv'd into the orifice of it, seem'd to be embrac'd around, with a kind of ring as it were; for in this manner he assur'd them, that the ulcers of the rectum, or vagina, were frequently found, so that a narrow mouth is dilated into a more capacious sinus. And in the second, without introducing his finger, he not only show'd that there was an ulcer, but also that it was not very high up; for there were some, among the others, who suppos'd that what was excreted, was a mucus press'd out from the glands of the rectum, which are pretty high up in the intestine. But these he easily convinc'd, even by the testimony of the patient himself; for as he confess'd that this matter flow'd from him continually, it follow'd of course that the original springs of it could not be above the sphincter. And as this matter, even in the opinion of Valsalva himself, whose judgment, in an affair of that kind, was known to be peculiarly excellent, was without any hesitation pronounc'd, and even demonstrated, to be purulent, there now remain'd no doubt at all, but it was to be accounted for from an ulcer. And they so much the more esteem'd his judgment, in this case, as it was well known to every one, that he was extremely clear, in regard to those things which are also taken notice of, in the scholia to that first observation (z) of the fifteenth section, of certain mucous, and whitish sordes, sometimes proceeding from the anus, which, although they have impos'd upon some, and been taken for pus, yet are known, by the most learned physicians, to be excreted from the hæmorrhoidal veins, just as a fluor albus (which was the comparison of Platerus, who is quoted in the same scholia) is often secreted from the vessels of the uterus, without any suspicion of an ulcer. And this will be easily explain'd by you, in the same manner that you see, an uterine fluor, of this kind, explain'd by me, in the fourth of the Adversaria (a), that is to say, if you conceive that the apertures of the vessels, which, when in a more dilated state, pour'd out red blood, being now more con-

(x) N. 1.
(y) Aphor. 12.

(z) Supra, ad n. 10.
(a) Animad. 27.

string'd, though not altogether, do not suffer the red part of the blood to escape any longer, but only the serum of it, which is, of itself, viscid in some persons, or becomes mucous by stagnation, and that this distills gradually, or passes downwards, when press'd out by the excrements. And thus far I had to add on the subject of the piles.

LETTER the THIRTY-THIRD

Treats of the Prolapsus of the Intestinum Rectum:

THERE is not only no section in the Sepulchretum Anatomicum, upon the prolapsus of the intestinum rectum; but even no anatomical observations are extant any where, as far as I remember at present, which relate thereto. And since upon these, as upon a firm basis, all the solid reasonings of physicians, about the internal origins of diseases, or their continued causes, are generally founded; it is for this reason not to be wonder'd at that no treatise has ever yet been publish'd upon this disease (for no such treatise has fallen into my hands at least, though treatises have been publish'd upon more rare, and much slighter disorders) which might serve as a guide to any one, whose business it was to write upon this subject, and lessen his labour; for this subject ought not to be handled in a hasty, and confus'd manner.

I never found myself more in want of a treatise of this kind, than when I was ask'd to give the opinion which I have promis'd, in consequence of your long-continued entreaties, to send you a copy of in this letter. And I send it to you just as I then wrote it, its translation from the Italian language excepted. And I know very well, that the discourses upon diseases, which are requir'd by way of opinion, either almost immediately, or, within a very few days, by the friends of the patients, can have, when drawn up by me, no merit but that of dispatch. For which reason I give copies of them to none, but to those for whom they are intended: and from these persons, must have come those copies of opinions of mine, which you tell me you have read in great number; unless some have been falsly and surreptitiously taken, by those whom I employ'd as copists, as I see has sometimes happen'd.

But, although this which you will have at present, is not very much approv'd of by me, and though I had rather have sent any other; yet if it will not serve to shew, how to distinguish those opinions which are really mine, it will, at least, show you the greater part of those things, which I would wish to have enquir'd into, by anatomists, in relation to this disease. For this purpose then, it was written, and in the following manner.

2. I wish

2. I wish the internal causes, by which the disorder of this noble, and very learned, man was first brought on, and by which it is still preserv'd, were as evident as the disease itself, and the cause which increas'd it; and, what is of still greater importance, I wish that the most effectual methods of remedying this disease, were as well ascertain'd as the disease itself.

The disease of which I speak is a prolapsus of the intestinum rectum: and the cause by which it was increas'd, was a violent and long-continu'd straining at the times of going to stool. But in what manner it was increas'd, by these strainings, from whence it had its beginning, and what its beginning was, and by what causes it is still preserv'd, or, as the language of physicians is, continu'd; all these circumstances, especially at so great a distance of times, and of places, it is very difficult for me to subjoin, and to know almost impossible. But if there were any one who had been able to observe the symptoms, and crises, of that obstinate, and troublesome fever, to which the beginning of this disorder succeeded; and to consider, accurately, at that time, and when it was afterwards increas'd, and at this time also, of what nature the upper, and lower, extremities of the tube, which came forth, were, and what was its *consistence*; it would perhaps have been less difficult for him to conjecture the true causes of the disorder.

3. These causes, if they are even only consider'd jointly, may be many, and very different from each other. That very learned fellow-citizen of mine, Hieronimus Mercurialis (*a*), and Ambrose Parey (*b*), assign one cause in particular, I mean the relaxation of the sphincter ani, which suffer'd the intestine to come forth. But medical experience does not easily suffer me to assent thereto, as thereby I am taught, that a prolapsus of the intestine does not, immediately, succeed to a true paralysis of that sphincter, but only after some time has been interpos'd: and in our patient, in particular, I understand, how strong this muscle still is, so that it resists every other even violent motion. But Joannes Riolanus (*c*); I mean the father; adds to the relaxation of the sphincter, that of the relaxation of the levatores ani also: and this the greater part of physicians admit. However, that this was the case in the present instance, and had been so from the beginning, I would neither boldly deny, nor for a certainty affirm. I only say this, that if it was so, it certainly was not the only cause, after the disease had continu'd some little time. For I know from anatomy, that the part of the intestine, which can remain without the anus, from this cause alone, that it is not rais'd by these muscles, is the lower part, and only of the extent of a few inches; and that the part which lies above this cannot hang out for that reason, to the extent of eight or ten inches in length, and even to sixteen or twenty, if it be consider'd, that, by being inverted outwards, it must be in a double state.

4. It becomes necessary therefore, to look out for other causes, and in particular that, amongst others, which was hinted at, by the learned physician who consulted me; I mean the separation of the intestine from the mesocolon, or some other cause, which amounts to the same thing, and which happens more easily; as for instance, a relaxation, gradually brought on, of

(*a*) De morb. puer. l. 1. c. 10.

(*b*) Oper. chirurg. l. 7. c. 18.

(*c*) Meth. med. sect. 3. ubi de Ileosi.

the latter part of that mesocolon, which serves as a ligament to the rectum, and to that nearest, winding, and moveable, tract of the colon, into which the rectum terminates.

It does not escape me, that, to some very modern professors of medicine, it does not seem probable, that the whole body of the intestine should come forth, considering the firmness of its ligaments, and its close attachment to the vagina uteri in women, and to the neck of the bladder, and the neighbouring parts, in men, and considering an observation, besides, which they quote from Cowper (*d*), of a man, who, after a long continu'd prolapsus ani, and, at length, a sphacelus of the prolaps'd intestine, from too great intemperance, although he had undergone an extirpation of the corrupt parts, which hung down, not only recover'd his former health, but even liv'd quite free from the prolapsus. They, therefore, and the celebrated Junckerus (*e*), believe that the whole body of the intestine is not relax'd, but only the internal part, and that this, being thicken'd, is inverted, and push'd out: and I would not deny, but that which is suppos'd to happen in the prolapsus of the uterus, or, rather, in the more frequent prolapsus of the vagina, that many improperly confound with the prolapsus of the uterus itself, which is indeed very rare, is favourable to their opinion.

But, although I am not unappriz'd, how much membranes, that are drench'd, as it were, with moisture, may be relax'd, thicken'd, and made long, yet when I read over what our Fabricius ab Aquapendente (*f*) asserts his having seen in some persons, that is to say, "a *procidencia ani* so long, as " to be equal to the length of the fore-arm, and so thick, as to be equal to both the arms join'd together" (which passage, perhaps, had escap'd Junckerus (*g*), when he judg'd that a prolapsus, mention'd by Muralt (*h*), of an equal length, "almost exceeded all belief"); when I read, therefore, such things, I seem inclin'd to believe, in some certain cases, with the celebrated Polycarp Schacher (*i*), that the thing happens neither in that first, nor in the second manner, but rather in the third which is propos'd by him.

That is to say, the lower part of the intestinum rectum, which I have said to be firmly connected with the neighbouring parts, being unmov'd, the other part, which is superior to this, falls within it, together with the fæces, and being inverted, comes forth on the outside of the anus. For it is sufficient that the mesocolon is there relax'd, where it confines the rectum; or if the prolapsus is very long, that it is relax'd in that place besides, where it belongs to the neighbouring moveable, and winding tract of the colon, which being, in some persons longer, and in others shorter, as I have said in the third of the Adversaria (*k*), so it may be more or less extended, and descend, and suffer the rectum to be prolaps'd. But if this additamentum of mine were not sufficient, I should then, moreover, think of another, as if besides those three methods mention'd above, a fourth might be propos'd, according to which, what I just now spoke of, in the third, might happen, and the internal coat besides, as was said in the second, being re-

(*d*) Anat. of hum. bod. 601. t. 39. f. 7.

(*e*) Consp. med. tab. 110.

(*f*) De chir. oper. c. de ani procid.

(*g*) Tab. cit.

(*h*) Eph. n. c. dec. 2. a. 1. obs. 113. in schol.

(*i*) Disp. de morb. a situ intest. p. n. c. 2. §. 3.

(*k*) Animad. 6.

lax'd, inverted, and falling down, might come forth through the lower extremity of the prolaps'd intestine, and increase the length thereof, by being added to it.

5. It is not my custom, indeed, to use very long harangues in the theoretical part of medical opinions, for I am not ignorant that most patients are like the empirics, who do not doubt, as Celsus says (*l*), "that these conjectures, upon occult causes, are very little to the purpose, because it is of no importance what has produc'd the disease, but what will remove it." Yet in this case I thought proper to proceed differently, not only because the patient, who requires this opinion of me, is very learned, but also because, notwithstanding some animadversions, which I may deduce from those things that I have hitherto said, would not perhaps show the utility of what I have advanc'd, contrary to the opinion of the empirics (without doubt as the prolapsus of which I speak, may be join'd with one, or with another, or with many of the causes that I have hinted at, and as it is not in my power, for the reasons I gave in the beginning (*m*), without the greatest difficulty, and consequently without very great danger of erring, to determine with which it really is join'd) it is necessary, at least, to gather by a kind of induction, which is what I am at present doing, that it is always probable, whether there be, in this case, one, or another, or many, of these causes join'd together, that it consists in a kind of relaxation, and this a relaxation which began twenty years ago and more, as the effects of it show, and was afterwards gradually increas'd.

6. And as from this induction an indication arises, of restoring to the relax'd parts that first and proper measure of rigidity, or closeness of connection, their former situation, and firmness; so no person, whatever, who is even slightly vers'd in medical affairs, can fail immediately to perceive, that it is very difficult, not to say impossible, to bring this about. And if, as Galen has in general taught (*n*), disorders of the anus, or fundament, "are very difficult to be cur'd," which was, perhaps, the reason why some physicians, formerly, plac'd all their study on the cure of these alone (*o*), with how much more difficulty must this disorder, which is so stubborn, and of so long standing, admit of a cure? Indeed I do remember to have read of other, more considerable, prolapsuses being cur'd, as that was which I have spoken of from Muralt (*p*). But I do not remember to have read of an inveterate prolapsus, or one which had afflicted the patient for twenty years, being got rid of. For which reason we ought to be satisfy'd in the present case, if as the relaxation cannot be remov'd, we can, by means of the palliative method of cure, as it is call'd, prevent the daily effects of it, or render them less considerable, and more tolerable: for these effects are not only of importance, by reason of the uneasiness they give, but because they increase the disease, and also because there may be the highest danger, at one time, or other, either from the prolaps'd part being very much increas'd, or not being early replac'd, or injur'd from being expos'd to the air, or finally, from its being

(*l*) De medic. in præf.

(*m*) N. 2.

(*n*) De comp. medic. sec. loc. l. 9. c. 6.

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(*o*) Vid. l. Galen. adscr. de partib. art. med.

c. 2.

(*p*) N. 4.

Q

but

but little confin'd by the sphincter, which in a course of time may be relax'd, and particularly, at that time, when the strength of the constitution, being broken down by age, will be less able to resist this relaxation, or prevent that which is already present, from being farther increas'd.

7. But as I find that the most powerful medicines, whatever, have been in vain apply'd, to remove this relaxation; so I likewise see, that in the palliative method of cure, many and various instruments have been made use of in vain, against the effects of it; and that, for this reason, others are requir'd of me, and, in particular, a description of that which is said to have been invented formerly, by that very ingenious monk Paul Sarpi. But I fear lest all these which are known to me, may at length be refer'd to those, which have been already made use of; if we consider that which is the principal; and amongst these that of Sarpi also, since I find no description of it but this, which we read in Rhodius (*q*): "the piles being return'd back in-
" to their places, so as not to fall down again, let them be kept there with
" an iron ring aptly applied: which many have receiv'd great advantage
" from, and ascribe its invention to Paul Servita, a Venetian, and a man of
" great ingenuity. This ring is enclos'd, on each side, with soft leather,
" which is fasten'd towards the perineum, and the buttocks, by bandages
" that are sew'd to each of its four heads, being connected with a linen girdle,
" that goes round the waist."

The instrument of Sarpi, therefore, is of the same kind with the rings that have been already made use of: and that which, not to mention the *tabula angustissima* " of Hippocrates (*r*)," is recommended by Riolanus (*s*), and by two others among the French, Blegny (*t*), and Dionis (*u*), and before the latter, even by Muralt (*x*), that is to say, a tablet pierc'd through with a foramen of such a kind, as not to suffer the intestine of the patient to pass through, when he goes to stool, is upon the very same plan: and this tablet Muralt order'd to be enclos'd in a blue cloth, dyed with indigo, not what comes from Madagascar, but from the Caribbé Islands. And what Parey recommends, amounts, at length, to the same thing, though without the application of any instrument, when he says (*y*), " if the patient could discharge the feces, in an upright and standing posture, the intestine would
" never be in danger of being thrust out, by the straining."

But as the patient, whose case is now propos'd to my consideration, cannot unload his bowels, unless, setting aside every kind of artifice whatever, he suffer the intestine to come out; I seem to be throwing away my time, if I do not endeavour to invent any other artifices of that kind, and do not rather inquire into the cause, why the use of instruments, of this kind, is, in the present case, without any advantage, so that this cause being known, either the ingenuity of some skillful surgeon may be excited, to find out one of a quite different nature, which might be useful, or if be it found, upon the inquiry, that this cannot be done at all, that the part affected may, hereafter, be troubled with no instruments whatever.

(*q*) Cent. 2. obs. med. 94.

(*r*) De fistul. n. 4.

(*s*) Sect. cit. supra ad. n. 3.

(*t*) L'art. de guerir les hern. p. 2. f. 2. c. 8.

(*u*) Cours d'oper. de chir. dem. 4.

(*x*) Schol. cit. supra ad n. 4.

(*y*) Cap. cit. supra ad n. 3.

8. And first, it is not to be suppos'd in the present case, that the intestine is, necessarily, to be suffer'd to come down, because the excrements are so thick and hard, that they cannot pass through those instruments which I have spoken of; for if this had been the case, it would have been provided against long ago, and absolutely prevented from happening, either by a suitable diet, or by solutive medicines, or by the injection of a small quantity of a liquor, proper to lubricate, and soften. It therefore remains, that the relaxation of the whole intestine, or of its internal coat, must be suppos'd so considerable, that the one, or the other, descending, when push'd down by the excrements, in a great number of large rugæ, laid one upon another, form something like a valve, especially as often as being retain'd by any kind of artifice, it cannot altogether extend, and unfold itself, and by this means give an open passage to the excrements. And if this be the real state of the affair, all artifices of that kind are to be remov'd; for as, by this means, that part of the intestine may be compress'd, betwixt the fæces which are increas'd above, and the instrument, no advantage can be expected from thence, but even a very considerable injury may, at some time or other, be fear'd.

Instead of these instruments then, a new one should be sought after, which might not only support the lower part of the intestine externally, as the former have done, but might, at the same time, reach so far, as to be able to support internally, and opportunely dilate, the relax'd parietes, that they may not, by being inverted, and push'd before the fæces, in the form of rugæ, or valves, stop up the passage of these fæces, when they are about to be discharg'd. It would be necessary, that this instrument should be of such a nature, as to render it easy of insertion, into the intestine, and should be moderately, and gradually dilatable, as soon as ever the necessities of nature may begin to require, nor should there be the least danger of its injuring the intestine, either laterally, or in the upper part of it, but particularly in the upper part: to prevent which danger, all the upper parts of the instrument might be invested, before its introduction, with the soft and fresh intestine of some little animal.

The well-known contrivance of those instruments call'd specula, which surgeons us'd to dilate the vagina uteri, and even the intestinum rectum itself, might perhaps, to a prudent, and skillful, contriver of instruments, supply a much better, and less disagreeable, idea of this instrument, with which it would be sufficient to keep that part of the intestine extended, that is easily dilated, I mean the part which is above the sphincter; and to leave no larger a passage open through this part, that most resists dilatation, than would be sufficient for the soft, and almost fluid, excrements to pass through; for care must be taken, by a suitable regimen, to keep them, constantly, in such a state.

But as I well know that most machines, when apply'd to their uses, generally correspond but little with the expectation of the inventors, and as in this case, in particular, I see what disadvantages might arise, not only if an un-experienc'd hand should introduce the instrument, and dilate the intestine, but also from the frequency of the introduction, and dilatation, and even from the very motion, and compression, of the intestine, while the fæces

should be expell'd; and as I cannot know, for a certainty, that the relaxation does not begin higher up, than the instrument can reach, I profess that I have enter'd into this discussion, with no other intention, than to excite others to look out for a more natural, and commodious idea: and if it were certain, that this could be reduc'd into practise safely, and without suspicion of any danger, it would then, indeed, be neither improper, nor perhaps useless, to make the experiment thereof.

9. But if, as I am very much afraid, on account of the causes just now hinted at, it should be taken for granted, universally, and not without reason, that in the palliative cure, there is no room for the trial of any instrument whatever, then nothing would remain for medicine to do, but to examine, whether in the methods of cure, which have been already made use of, in order to remove that relaxation, any remedy had been omitted, by which, if the disease could not be overcome, it might at least be in some measure diminish'd.

10. Many assistances were formerly taken from surgery against this disease. Riolanus (z) recommended two cupping-glasses, to be apply'd, one to each side of the lower part of the os sacrum, or to the buttocks, as Schacher (a) mentions, who expected some advantage from thence, when the chief cause of the disease consists in the muscles of the anus being languid. Yet I have no more expectation from this practise, than from two cauteries being apply'd to the lower part of the spine, which Mercurialis (b), following the sectaries of the Arabians, has propos'd, and Marcus Aurelius Severinus (c) has confirm'd; unless, perhaps, they ought to be apply'd in a person whose habit of body was very different from that of our patient's, and in whom the prolapsus had been brought on, or continu'd, from too great an afflux of humours to the part.

But as to the famous remedy of that ancient surgeon Leonida, whom the celebrated man, Daniel le Clerc (d), supposes to be the same with Leonides, the physician spoken of by Cælius Aurelianus (e), under the title of Episynteticus; I will neither omit the opinions of others, nor conceal my own. When diet, therefore, had been of no advantage, nor medicines had contributed any thing to the alleviation of the disorder, and the evil was now grown inveterate, Leonida judg'd it to be necessary, and not at all dangerous, to burn the external, and extreme, part of the anus with some cauteries; for that, by this means, a solid cicatrix succeeding, the anus would be constring'd all round, and the prolapsus remov'd. These things may be read somewhat more clearly, and distinctly, in Aetius (f), who has preserv'd, and handed down to us, this, and other curative methods of Leonida: and this method has been taken notice of by Fabricius ab Aquapendente also (g), and by Riolanus (h).

As to Severinus (i), he not only mentions it; not only confirms, by many observations of his own, that the actual cautery had succeeded very happily with

(z) Sect. cit. supra ad n. 3.

(a) §. 9. cap. cit. supra ad n. 4.

(b) Cap. cit. supra ad n. 3.

(c) De effic. medic. l. 2. p. 1. c. 50.

(d) Hist. de la med. p. 2. l. 4. f. 2. c. 1.

(e) Acut. pass. l. 2. c. 1.

(f) Medic. tetrab. l. 4. ferm. 2. c. 8.

(g) C. cit. supra ad n. 4.

(h) Sect. cit.

(i) Part. cit. c. 95.

him, when applied to this part, though in other disorders; but he calls the physicians timid, and slothful, because they would not suffer him to apply the same method of cure, to a gentleman of the noble family of the Surgentii, whose prolapsus, like that of our patient, was of twenty years standing, and had, like his, received no benefit from all kinds of medicines.

On the other hand, Blegny (*k*) entirely rejects this kind of cure, as not less troublesome, than unusual, in our present times. And Dionis (*l*) says, that he never saw it, calls the authors of it cruel, and the operation itself horrible, even to those who hear of it: and believes that if there should happen to be any medical practitioner, who would willingly try it, no patient, nor any one else, certainly, would consent to it, and that with great good reason, because these disorders may be cur'd without it: although it does not at all appear, by what means he could prove this assertion, as he proposes no remedy that seems to be equal to the cure of this disorder, in our patient.

However, it is by no means necessary for me, here, to assent, either to the epithets of timid, and slothful, with Severinus, or to that of cruel with Dionis. For although I do not deny but the method of cure taught by Leonida, may be useful in a small relaxation, when it is pretty low down, and that this is, in some measure, confirm'd by the observation of Cowper, which is pointed out above (*m*); yet in this relaxation that I am speaking of, which is so very considerable, and seems to begin so high up in the intestine, I am very much afraid that it would not be of any great advantage, if it were of any advantage at all.

II. In the mean while, leaving to better judges than myself, the farther examination of these methods of cure, which were formerly made use of by surgeons, I go on to consider a more modern instrument, the author of which testifies its having been very useful in many prolapsuses.

This author is Blegny (*n*), whom I before mention'd, a man truly ingenious. He took the craw of a turkey-cock, and tied the orifice of it fast to one extremity of a short, and slender tube, made of silver; and at the other extremity, he introduc'd a stick, which was blunt, at its upper part, quite to the bottom of that pipe, and by this means, first introduc'd this pipe, and afterwards a proper part of the tube, daub'd over with astringent remedies, into the rectum; the remaining part of it he kept on the outside of the anus, in such a manner, that when he had taken away the stick, and, in the place of it, had inserted into the same part of the tube, the pipe of a small pair of bellows, and had driven in such a quantity of air, as was sufficient for filling the craw, the air could not return before the patient was willing, and being, consequently, retain'd, would support the relax'd parts, and cause by its frequent, and long-repeated use, that they should, as far as possible, recover their former situation, and strength. But it is better to see the accurate description of this instrument, its delineation, and the manner of fixing it, in the works of the author himself.

It is true I agree with Dionis (*o*), readily, herein, that even this instrument is not without its inconveniencies, nor does it answer the end of retaining the

(*k*) Cap. cit. supra ad n. 7.

(*l*) Demonstr. ibid. cit.

(*m*) N. 4.

(*n*) Cap. paulo ante indic.

(*o*) Demonstr. paulo supra indic.

intestine in its situation, at that time, when there is most need of it; I mean when the patient goes to stool; since it must, of course, be then taken out, and soon after be replac'd, when the intestine has been return'd back again. Yet I deny that this instrument produces, as he says, the same effect with bandages, and other external applications. And indeed, excepting the inconvenience, which is not very considerable, and that a cautious, and skilful, hand is requir'd to replace the instrument, I should suppose that it would be not altogether without its advantage, especially in the beginning of relaxations of this kind.

It might even be consider'd, whether, instead of that craw, it would not be better to make use of the soft intestine of any animal, which was furnish'd with slender coats, of such a proportion, as to length, and breadth, as it was convenient, or necessary, to introduce, having the upper extremity closely shut up internally, and being daub'd over externally, with that medicine which I shall recommend below (*p*), to be made use of after going to stool: this intestine being thus sufficiently introduc'd, and air being soon after injected, or even sometimes a liquor of a proper quality, it might be entirely distended, or at least to such a degree, as not to bring on a desire of going to stool.

It is not easy, perhaps, to find a more commodious, and at the same time a more innocent, remedy than this, in order to replace, and retain, in its native seat, the relax'd coat of the intestine, and even the intestine itself, so that by this means the ligaments of the intestine may be eas'd, and, the weight and extension being taken from them, they may have an opportunity of restoring themselves, in some measure, and regaining their strength. However, although I suppose, as I have already said, that in the beginning of the disorder some advantage might be hop'd from thence, and, certainly, more than from the tents, which others apply with the same view, impregnated and daub'd over, with astringent remedies; yet what use may be expected from it, in an inveterate disease, I confess, I do not see.

12. As to pharmaceutical remedies, it becomes me to be so much the more short on this subject, as I am inform'd by the letter of the physician, who consults me, that all the medicines have been already made use of, that could possibly be devis'd, whether of the agglutinating, vulnerary, or astringent kind, or such as help the nerves; and as I see that all the books, both of physicians, and surgeons, are full of remedies of that kind. And although I see that, in the same letter, fomentations, femicupia, injections, cerates, fumigations, and other external forms of medicine only, of the same kind, are taken notice of; yet I do not doubt, but internal medicines, correspondent thereto, were us'd at the same time. And, indeed, I very clearly conceive, that what could not hitherto be obtain'd by these remedies, is much less to be expected from them hereafter, as the disorder is, in the mean while, become more considerable, and the causes of it more confirm'd.

Nevertheless, as long as the life, and the strength, of the patient, are in a flourishing state, the cure, perhaps, ought to be repeated; for it is certain, that a long-continu'd, and vigorous, method of cure, repeated cautiously, and prudently, could never be of any disadvantage. And in this regimen,

should be included all the most corroborating medicines, which however should be taken from the class of those that assist the nerves, rather than from those that have strongly astringent properties; for the fæces being harden'd by these, the patient must, of course, make use of more violent, and a greater number of, strainings, in going to stool, whereby the disorder would be more and more increas'd. For which reason, likewise, all those medicines are to be rejected, that are call'd purgatives; for they lead to the injur'd part, and leave very troublesome, and noxious, irritations therein. But if it is necessary to loosen the belly, such things must be made use of, as will be presently taken notice of in the diet, or some things similar to them, that are quite innocent. And in regard to remedies, that are to be externally apply'd, I should greatly prefer, as to the form, the semicupia, and injections; as to the matter, the strengthening waters of warm baths.

13. It remains to speak of diet, as a proper regimen, in this respect, is altogether necessary, since it not only assists the effects of the remedies, which are taken from surgery, and pharmacy, but also because, if these remedies are not at all repeated, or repeated to no purpose, there is then no other method, besides this, remaining, by which we can endeavour, with the greatest ease, safety, and frequency, to render the disorder, at least, less troublesome, or lessen its danger. Mercurialis proposes such a kind of diet (g), as has a drying property: and there is no doubt but this regimen conduces much to strengthen the habit: but if we consider, and well-weigh, the very great, and frequent, inconveniencies, which would arise from the intestinal fæces being harden'd, by such a method of living; it will certainly seem to us, and especially after corroborating medicines have been so long made use of, to no purpose, that a mode of diet which is of a moist, and softning nature, is to be prefer'd to that which is so powerfully drying, as such a regimen would serve to keep the excrements soft, and, at the same time, correct their acrimony.

That very cautious physician, Francisco Redi (r), in his advice against a hæmorrhoidal flux, and pain, join'd with a prolapsus of the intestine, at the time of going to stool, order'd meat-broth to be drunk in a morning, to the quantity of half a pint, without any salt, and in this broth he order'd to be previously boil'd, a pretty large quantity of violets, and after these could be no longer had except in a dried state, he order'd, in their stead, succory, or borrage, or bugloss, or sow-thistle, fresh or dried prunes, quinces, or something of the same kind. He recommended the use of depurated whey, sweeten'd with a julep, made either from the tincture of fresh violets, or quinces. He also recommended the use of asses, or goats milk. At dinner, and supper, amongst other things, he order'd a pudding to be a constant dish, but this was to be very simple, and to consist chiefly of broth, in which apples had been boil'd, or some herbs of the number mention'd above, and sometimes also a little barley, or rice. He prefer'd boil'd meats more frequently than roast. And omitting aromatics, and wine, he order'd dinner and supper always to be concluded with a scalded apple, or a bak'd pear, drinking after it three ounces of water, sweeten'd with a syrup, made from citron peel.

(g) Cap. cit. supra ad n. 3.

(r) Opere dell' ult. ediz. t. 4. verso il fine.

From these things that I have related, as they stand in the opinion of Redi, I should not recede much in this case, or, at least, only so far, as to prevent the bowels from being too much open'd. But if that regimen of Redi's were not sufficient, for it ought, by being continu'd, to be sufficient to keep the belly so far lax, as to prevent there being any necessity for straining, or for sitting long when the patient goes to stool; then, indeed, I should not be against imitating Redi, also, in giving two drachms of the pulp of cassia sometimes, which should be taken in the morning before the broth, of which I have spoken, and repeated again, in the same quantity, a little before supper, if the former had as yet produc'd no effect. But if, in spite of this regimen, the excrements, nevertheless, still continu'd hard and dry, I should judge that they ought not to be discharg'd, by the means of straining, but by the assistance of glysters.

Yet these glysters ought not to consist of more than half a pint in quantity, that they may be retain'd, with the greater ease, for a proper degree of time, and ought to be made up of broth alone, or the barley emulsion, as it is call'd, or an emulsion of rice, which had been previously half-burnt, as it were, and boil'd, and this also in imitation of Redi. Who, finally, gives great commendations to a certain yellow ointment, (call'd *manteca*) and made from roses, such as was prepar'd by the perfumers of the grand Duke of Tuscany, affirming, that the prolaps'd intestine is much sooner, and more easily, replac'd, if the extremity of it is smear'd over with that ointment, by which, besides that the pains being alleviated, he says that the injur'd, and debilitated, part will be, not a little, corroborated.

However, the replacing of the intestine will be render'd less difficult, by the method of living prescrib'd, and the sparingness of diet. For by this means, neither a quantity of excrements will be accumulated in the neighbouring tract of the colon, which is a circumstance, that is generally a very considerable obstacle to the return of the prolaps'd intestine, nor will blood be generated, which either by its redundancy, or from any other disorder whatever, can tend to render the weak part preternaturally thick. And as this may, also, happen from violent motions, and exercises, it will be equally necessary to avoid these likewise; and, to comprehend the whole, in a few words, every thing ought to be diffus'd, which experience itself, much better than the advice of any physician, has, through the long course of so many years, demonstrated to be injurious.

14. These things I had to observe, in regard to the very difficult case, upon which my opinion was requested, hoping that the learned, and noble patient, on whose account they are written, will be so condescending as to excuse the hasty manner of putting them together, as I am, at this time, much taken up with many, and various pursuits, and that the very experienc'd physician who consulted me, will make what use of them he shall think consistent with his prudence, and the circumstances of the patient: and I beg of the almighty God that he will succeed whatever may have been, or shall be, determin'd upon.

15. You have, here, the opinion just as I wrote it, at the time, that is in the year 1725, on the thirteenth day of August. In which, besides the proximity, there are other things, wherewith I am not very well pleas'd, at present.

sent. But as it happen'd that I was to write on subjects little treated of, I could avoid neither the one nor the other. And I could wish there had been any one, since that time, whose anatomical observations would have set this affair in its desirable light. But these observations, as they were then unknown to the very learned Schacher (*s*), and to me, so they are still unknown. And what circumstances are to be inquir'd into, particularly, in the bodies of those whose intestine has been accustom'd to descend to a considerable length, will be shown by the foregoing opinion, yet perhaps not all. For who knows whether those ligaments, which resemble three small bandages, going from the upper part of the rectum, into the neighbouring colon, are not, sometimes, relax'd by too great moisture, or drawn asunder by the quantity of excrements, which is gathered together; or, by the violent and long-continu'd strainings, to discharge the fæces, do not only suffer, in consequence of this distraction, some of the last cells of the colon, but also a great number of those transverse rugæ, which are within these cells, to be extended, so as to increase the length of the prolaps'd intestine.

Care must be taken then, wherever bodies of this kind, which I still much wish for, shall happen to be dissected, to inquire, accurately, into the state of these ligaments, and cells, or if both of these parts are in their natural situation, to see whether the internal rugæ, at least, are not unfolded, and almost evanescent, which circumstance alone, would suffer the internal coat, wherein they are, to be so greatly extended downwards, that is, in consequence of being drawn, by the internal coat of the intestinum rectum, which is a continuation of that of the colon, and which, in my *Consilium* (*t*), I have suppos'd, following after the modern medical writers in particular, may be thus inverted, and prolaps'd outwardly. Yet, at the same time, I think it ought to be inquir'd in these very bodies, how far this inversion may really happen, or be allow'd of, as I have many doubts upon this head.

For the question is not at present, as it was on a former occasion (*u*), of one part only, and that to be compar'd, in some measure, with a kind of cuticle, as it were, which is separated, but of the whole internal coat of the rectum: and that this should be let loose from the muscular coat, so as not to be a dead part, nor yet to have any very violent symptoms join'd with it, is difficult to be believ'd among those who have observ'd the innumerable, I do not say, small fibres and nerves, but only the innumerable little arteries, and veins, by which one is join'd to the other.

Whether, therefore, these small vessels can be so relax'd, and extended, by degrees, as the great inversions of the internal coat particularly require, which many suppose to happen in this case; or whether the example of tumours, in which it is certain that a great extension of the vessels does really happen, takes place here, where the internal coat is said to grow thick indeed, but still to be preserv'd flexible, and in a proper state to be replac'd; or finally, whether these inversions, which are generally suppos'd to be of the same nature in the rectum, as in the vagina uteri, are in fact of the same nature, and how far, will never be learn'd with more certainty from any thing, than from a very accurate dissection of these bodies. Nor indeed can the opportunity of dissecting bodies of this kind, be very rare, and

(*s*) §. 3. cit. supra ad n. 4.(*t*) N. eod.(*u*) Epist. 31. n. 20.

especially in great cities. For this disease is fatal to many, that is, in consequence of inflammation, and gangrene, seizing upon the intestine, when the replacing of it has been too long neglected. But it also, sometimes, happens, in those who have been taken off by other kinds of death, that many things offer themselves, the examination of which may be useful, in respect to this matter, whether they have been liable to a prolapsus of the intestinum rectum, or whether, from any cause whatever, as, in a certain common soldier (x), “a prolapsus, or devolution, of the colon into the rectum,” occurs, which in him was “equal in length, to a span.” And Salmuthus (y) did not doubt, but the colon, as well as the rectum, might be prolaps’d, when to the observation of a sucking child (z), who forc’d the intestines out at the anus, in a violent epileptic paroxysm, “to a very great length,” he prefix’d this title, “a procidentia of the intestine colon from an epilepsy.”

I with he had dissected the body of that girl, who was about fourteen years of age (a), in whom, from the neglect of a very violent tenesmus, “the whole intestinum rectum, with a part of the colon, was forc’d out at the anus, to the length of two spans and more.” For as it could not be properly restor’d to its natural situation, and as a gangrene had already seiz’d upon the extremity of the rectum, she died, he himself being surpriz’d, how so great a portion of the intestines could have fall’n down, from the mesentery. But if many, and various, bodies could, at length, be accurately dissected, either of those who died of a prolapsus, that had then afflicted them, for the first time, or of one which they had been troubled with before, or of those who, as they had been subject to the same prolapsus, and that gradually increas’d to a great length (b), were differently affected with disagreeable symptoms, and different kinds of uneasiness arising from thence, of whatever disorder they may have died; it is not to be doubted, but it must be much more easy for physicians, to point out the causes, and cure, of this disease, when consulted thereon.

16. But as the conditions of the case then propos’d, led me, in the theoretical part, to some things which are perhaps not very probable, so in the other part also, they naturally led me to many, which may be much more easily wish’d for, than brought about. But if the patient had not lain under that peculiar necessity, of removing every instrument, or artificial contrivance, from him, and suffering the intestine to be prolaps’d, when he wanted to discharge the fæces, assistance would not have been wanting, which I could propose, to keep the intestine in its natural situation, while the fæces were discharg’d.

There was, in the first place, the ring of Sarpi: in regard to which, besides what I have related above (c), from Johannes Rhodius, I also remember to have read these things, in the life of Sarpi; that when he had long labour’d under this disease, and had, at different times, tried a great number of remedies, but all in vain, he, at length, began to inquire after a kind of instrument, whereby he might retain the intestine, for which reason, after many attempts, he had, at length, found out one so proper to the purpose,

(x) Aët. n. c. tom. 2. obs. 103.

(y) Obs. med. cent. 1.

(z) 31.

(a) Obs. 30.

(b) Vid. Epist. 65. n. 6.

(c) N. 7.

that, although he labour'd under the disorder to the very end of life, he did not, for that reason, suffer an impediment of any action, any more than if he had been without the disease, and that the same was so simple in its contrivance, and so easily apply'd, that it had equally the same effect with others, to whom he had communicated it.

But if this life, by reason of the author's (whoever he may be now suppos'd to be, by a very great man, who will be commended in another place), I say, if by reason of the author's real, or craftily-pretended, ignorance of some things, so that in the *Epistolæ Anatomicæ* (d), I was willing to make no other use of this life, than for the sake of refuting by means of it, *ad hominem* as the phrase is, those who had laid this real or-pretended ignorance to his charge; if therefore it should be suspected in this point likewise; another instrument would not have been wanting, which I had seen taken notice of, in a certain opinion of our Valsalva's. That is to say, when the patient went to the close-stool to discharge his excrements, a cover for it was at hand, perforated in the middle, and there furnish'd with a leaden tube, which was firmly fitted to the aperture, and smear'd over with wax, externally, and on the upper border, not wider than two-third parts of the inch of Bologna, and about two inches long, but not to be admitted into the rectum above an inch and a half, nor without the assistance of a cautious surgeon, when the first experiments of it were made, so that if they succeeded happily, nor any thing was to be alter'd in the dimensions of the tube, the *scæces* might be discharg'd in this manner, and the intestine not push'd out.

But if neither of the instruments had answer'd our expectations; for you perceive, even from the hints I have given in my opinion, what injuries, not to say what uneasinesses, might sometimes arise from applications of this kind; there were still others besides these, that might be thought of. For you see, by way of example, what a kind of ring was invented, by the celebrated Bassius (e), which, "without being any obstacle to the discharge of the *scæces*," is worn without any trouble, as he says, and after it has remov'd the disease, may be as easily taken away; for he asserts that it had remov'd the disease, and that when it had been of long standing, in a short time, even within the space of two months. But let these things be sufficient upon the subject of the prolaps'd intestinum rectum. In the next letter I will go on to consider other diseases. Farewell.

(d) 15. n. 68.

(e) Dec. 1. obs. 4.

LETTER the THIRTY-FOURTH

Treats of Pain in the Intestines.

ALTHOUGH the greatest part of the observations, of which the fourteenth section of the third book of the Sepulchretum Anatomicum consists, relates to pains of the intestines; yet there are even many therein, which relate to other viscera of the belly, and in both these classes are some, in which, not internal causes, but such as came from without, blows, for instance, and wounds gave rise to the pain. This example I do not choose to follow, as I have treated, or am to treat, of pains in other parts of the belly, on other occasions, and of each in its proper place, and am likewise to write separately, hereafter, of blows and of wounds. And I am also unwilling to be troublesome by repetitions, which are so far from being avoided in the Sepulchretum, that, in this very section, we find many observations set down twice (*a*), and in the additamenta, to the same section, we find, by reason of not detecting the tricks of Blancard, three repeated under his name, that is to say, the fifteenth, the sixteenth, and the twenty-third, the two last of which had already been given in this very section (*b*), as the first had been in the preceding eighth section (*c*), in the names of their real authors.

Nor is it my intention to imitate the author of the Sepulchretum, in dividing my observations into two classes, that is into those which relate to the colic and to the iliac pain; not that I altogether disapprove this division; although Diocles Carystius, as Celsus teaches us (*d*), nam'd the disease, not of the smaller, but of the larger intestine, *εἰλεόν*; and Alexander Trallianus, as you have it in Salius (*e*), judg'd "that the iliac passion was nothing more than a heightening, and increase, of the colic affection," and Salius shews* that the primary seat, and cause, of the ileos might be in both of those intestines; but because it is not so easy as many imagine, to distinguish the pains of one intestine, from the pains of the other, and, consequently, not very easy, by means of the signs, that have been observ'd in patients, to divide the observations of this kind with sufficient clearness, and precision.

2. For in regard to the iliac pains being said to be more severe, than the colic pains, as without doubt they are, whether you suppose this to arise, from

(*a*) Confer. obs. 1. §. 2. & obs. 20. §. 14. obs. 1. §. 13. & obs. 24. §. 2. obs. 1. §. 14. & obs. 19. §. 4. obs. 2. §. 1. & 2. obs. 5. §. 2. & schol. ad §. 8. obs. 19. obs. 8. §. 11. & obs. 14. §. 3. obs. 28. & obs. 30. §. 4.

(*b*) Obs. 20. §. 12. obs. 3.

(*c*) In addit. obs. 5.

(*d*) De medic. l. 4. c. 13.

(*e*) De affect. partic. c. 11.

* Ibid.

the quantity of vessels, by reason of which, the small intestines are more frequently found to be inflam'd, than the large, or whether you rather suppose it to arise from the number of the nerves, especially if the villi, with which the small intestines abound, to so great a degree, are to be refer'd to the class of papillæ; at least, there is no doubt, but one person is more impatient of pain than another, and the cause of pain is different in different persons, and in some less violent than in others; so that it is not easy to determine, which is really tortur'd with the most excruciating pain: and from hence, perhaps, it arose that Galen, some passages of whose works, that are contradictory to each other, Ballonius studies to reconcile, has in one place said, as you see in this section of the Sepulchretum (*f*), that the iliac disorders were the most violent, and in another place, that the colic disorders were the most violent.

But as to the vomiting, which he has asserted to be the most violent, and continual, in the iliac passion, you will find that those colic pains are justly excepted in the Sepulchretum (*g*), which have their seat in that part of the colon, where this intestine lies contiguous to the fundus of the stomach.

And not to lead you away from the Sepulchretum, you may likewise be warned from thence (*h*), how liable to exceptions frequently, and, for this reason, fallacious, that sign may also be, which, in other respects, seems to be the chief, I mean that which is taken from the very situations of the smaller, and larger intestines. For you will find the words of Franciscus Sylvius teaching, "that the colon is often carried, through " the " middle of the abdomen, to the navel, and sometimes even quite to the " bladder, by a considerable deviation from its more usual course." And if it be true, that when the colon deserts its own proper situation, it takes up that of the small intestines; you plainly perceive how much he may be deceiv'd, who depends greatly on the respective situations of these viscera, in determining the disorder. And not only they, whom Sylvius argues against, will be then deceiv'd, but they, also, who follow Sylvius. For when that part of the colon which generally runs in a transverse direction, to the direction of the body, and lies in contact with the stomach, is not really in that place, but is so remarkably inflected downward; there is no doubt but those persons must err, who deny that this part of the colon is seiz'd with pain, by reason, that the pain, and torture, do not run across the upper part of the belly, like a belt; and they also will, of course, blunder, who suppose, with Sylvius, "that a pain which has its seat in the circle, and " circumference, of the belly, is truly of the colic kind;" for the pain, which then arises, in the upper circle of the belly, cannot have its seat in the colon, which is not in that part.

3. And that what Sylvius has warn'd us of, does, in fact, frequently happen to the colon, not a few of the observations, both of Valsalva, and of mine, which have either been already propos'd, or are to be propos'd hereafter, will confirm: although I have not had, nor shall have, occasion to take notice of, in these letters, all the bodies in which I have found it thus; for it is long since that I began to observe this variation, even before I hap-

(*f*) Schol. ad §. 5. obf. 5.

(*g*) Schol. ad §. 2. obf. 25. in fin.

(*h*) Schol. ad obf. 41.

pen'd to light on this passage of Sylvius, as the second of the *Adversaria* will demonstrate (*i*). But in the third of the *Adversaria* (*k*), I have also observ'd another variety, in the lower situation of the colon, which is by no means to be pass'd over here: although there, in like manner, for the same reason, I could not, according to my custom, commend those who had observ'd it before me, Spigelius (*l*), and Riolanus (*m*); to whom, however, it seems to have happen'd, contrary to what has occur'd to Valsalva, and to me, that the colon has been, more frequently, winding in its termination, and has more rarely taken a pretty strait, and simple course.

But be this as it will, as these flexures not only extend the colon, in some bodies, towards the right groin, but, sometimes, as I have seen, raise it up by means of flatus to a turgid state, and particularly at the navel; it certainly appears from hence, how easily the pain, which is in that intestine, may be then, without reason, suppos'd to have its seat in the small intestine, of which this place is the common and natural seat. Both these species of variety then, are not uncommon, whether from the first formation of the body, or even from disease, as the words of Riolanus obscurely hint (*n*): these words are, "I have seen the intestinum colon, not stretch'd out, directly, betwixt the liver, and spleen, but inflected in the manner of an Italian S, and PRO-LAPS'D quite to the navel:" and Spigelius (*o*), speaking still more clearly, and more generally, says, that the same intestine "when preternaturally distended with flatus, in colic pains, is remov'd from its natural situation." But if you choose to suppose, that, for this reason, it was that I found, in an apoplectic woman (*p*), who had been subject to those pains, the colon not only with fewer cells than usual, but also writhing itself with larger turns than it generally does, in its extreme part, towards the navel, I shall not contend with you upon the subject, especially as I see, from the observation which, in this section of the *Sepulchretum*, is the fifteenth, and is read more at large in the ninth section, of the first book, where it is the forty-eighth, as I see, I say, that Franciscus Sylvius had suppos'd another woman to have labour'd under the same excruciating pains, not so much because the omentum did not, as he had remark'd, cover all the intestines, or because these were somewhat mov'd from their places; for the latter occurs pretty often, and the former very frequently; as, unless I am much deceiv'd, because he had found, in the same woman, both the species of variety which are just now explain'd.

However, if the situation of the intestine colon were chang'd, only from a cause of that kind, yet the danger of erring would be so much the more to be fear'd, as the question about these situations, is for the most part in those persons, who are wont to be subject to that cause. But in those persons, likewise, in whom the stomach is much dilated, and the liver enlarg'd in its size, that transverse part of the colon, which lies under these viscera, must be lower, in the same proportion as they are enlarg'd. Add to these, such causes as depress the stomach, and with it the colon, as I have seen it hap-

(*i*) *Animad.* 2.

(*k*) *Anim.* 6.

(*l*) *De hum. corp. fabr.* l. 8. c. 5.

(*m*) *Anthropogr.* l. 2. c. 14.

(*n*) *Ibid.*

(*o*) *C. cit.*

(*p*) *Epist.* 3. n. 2.

pen in a young man of Venice (*g*), from a very irregular inflexion of the spine. But besides diseases, there are also naturally different constitutions of bodies, and in these different constitutions, different situations of the colon. For even from the birth, as was hinted just now, it may be differently plac'd, and in gravid women, when the uterus is so much increas'd in its size, in the last months of pregnancy, that transverse part of the colon is higher, as Spigelius observes (*r*).

4. And these things being granted, and it appearing sufficiently from hence, why I do not divide the observations relating to pains, with which the bowels are tortur'd, in such a manner, as to class some under the title of iliac, and others under the title of colic pains; it remains to point out the division, which I choose to make use of. First then, I will give those in which there were pains from a cause that did not proceed from without indeed, but nevertheless was visible; and in the second place, those, in which the cause lay hid quite within the body. And these two of the former kind I give you from Valsalva.

5. A man of forty years of age, of a temperament partly sanguineous, and partly bilious, who had, sometimes, been affected with a slight hernia in the groins, was seiz'd with an iliac passion, after eating artichokes. A slight tumour appear'd in the groins: yet the patient denied his having any pain there; though he confess'd he had much pain in his belly, which was very much harden'd from the retention of the fæces. All remedies being without effect, he sank under the violence of the vomitings, on the seventh day of the disease.

The belly being open'd, the intestines appear'd to be turgid with air, and were livid and black, in that part where, not very far from the cæcum, they were doubled, and with the annex'd portion of the mesentery, which seem'd to be fleshy, as it were, descended into a hernial sacculus, which was four inches long, and had a very narrow orifice, so that they could not return back through it, into the belly, after they were distended by the matter, that had fallen down into them. This sacculus was in the right groin, and form'd out of the peritonæum indeed, that was produc'd and dilated, but not from a process of it; as many believ'd formerly; which accompanies the vas deferens, and spermatic vessels: and it even lay, anteriorly, upon this process, and these vessels, which were very tumid with blood: and was, internally, as the intercepted portion of the intestine was, of a blackish colour, or rather ting'd with a black that began to change into green, as if the colour had been given by a tincture of vitriol. And in the left groin was another sacculus, very much similar to the one I have describ'd, except that the membrane, of which it consisted, had its fibres, and vessels, not alter'd in their colour, or other qualities, from their natural appearances.

In the thorax every thing was sound. Yet in the heart were polypous concretions, of a yellowish colour, with grumous blood, one pretty large, in the right ventricle, and another smaller in the left; but neither of them was produc'd out of the ventricles.

6. There was an evident cause of this pain, that is, according to the common phrase, an incarcerated hernia. Of which there will be frequent men-

(*g*) Epist. 4. n. 16.

(*r*) C. cit.

tion made in this letter; but only as far as a part of the intestine being compress'd, is the cause of strangulation to the vessels of this compress'd part, and the parts nearest to it: and the manner in which pain, inflammation, and sphacelus, are brought on from hence, it is by no means necessary to explain. Other circumstances in regard to herniæ, and the portion of the peritonæum, which accompanies the spermatic vessels, I shall speak of elsewhere (s). But of the iliac passion, I shall treat at different times, in this letter, as much as will be sufficient for our purpose. But now you readily conceive, that where this disorder arises, as it for the most part does, when an intestine is intercepted, and compress'd, that then the upper intestines are of course distended, by the matter, which is heap'd up above the interception, and that from this distention another cause of pain arises, which is also increas'd by the very corruption, of the matter collected, which corruption, is the consequence of stagnation.

But how shall we suppose it to have happen'd, that in the history I have given you, the patient should deny the existence of any pain, in that part where the disorder was the greatest? Was it because a sphacelus had seiz'd the intestine which was intercepted, without any previous inflammation? For whether this could happen, we shall see on another occasion (t), or rather was this the reason of the patient's denying the pain, that the inflammation had already degenerated into a sphacelus? For there are other things also in that history, as it is written by Valsalva, which show that it was not very accurately committed to paper.

Yet he does not make the least mention of pain, even in the next history; though the very case will, of itself, sufficiently show, whether pain could be absent, or not.

7. A man in his fiftieth year, who labour'd under an enterocoele, was seiz'd with an ardent fever, and, after some days, with a vomiting of humours, which seem'd to be ting'd with foot, as it were: he at first made water with difficulty, and after that made none at all. The catheter was introduced by the surgeon, but to no purpose; for when it came near to the bladder, it met with an obstruction. Wherefore being troubled with these symptoms the patient died.

The belly, and the scrotum, being dissected, the intestines, which were fallen into the scrotum, were found to be affected with an inflammation: and notwithstanding there was no ulceration in them, yet a little sanious serum was seen in their interstices. Some traces also of a sanious humour, of that kind, were seen in the pelvis of the abdomen. The bladder was full of urine, although it had no mark of injury internally. And the obstacle which was near the bladder, and had prevented the surgeon from introducing the catheter, was found to be nothing else but one of the foramina, by which the semen is discharg'd, dilated to such a degree, that the extremity of the catheter, naturally, fell into it: for the same thing happen'd to the probe also, which was introduc'd, in the dead body, through the urethra that had been in part, laid open, in order to examine into this very circumstance.

(s) *Epiß.* 43. n. 6. & 7.

(t) *Epiß.* 35. n. 19. & seq.

8. Is it not more probable, that this foramen was the sinus in the feminal caruncle, since describ'd by me, which, in this man, had been immoderately enlarg'd? For if it had been one of the feminal ducts, it seems that the man must have labour'd under a flux of this kind. And there is no doubt but the orifice of that sinus is sometimes bigger, and sometimes less, which has also been observ'd by the celebrated Henricus Bassius (*u*). But it never more happen'd to me, as far as I now can call to mind, from the time that I publish'd upon this sinus, in the year 1719 (*x*), though I shov'd it every year in the theatre, and sometimes in more than one body, that I found any feminal duct, which open'd into it, and still less that it seem'd to me, as it did to him, that "this hiatus was sometimes only a slight fissure, or sulcus, which appear'd after these parts had shrunk, and become flaccid.

But whether the caruncle within which this sinus lies, as well as the sinus itself, was enlarg'd; and whether, by this means, the orifice of the sinus might, perhaps, be able to obstruct a very slender catheter, and likewise cause a suppression of urine, although the supposition is probable, yet as Valsalva has added nothing besides, I shall the more readily leave it undetermin'd: because; to say nothing of the cause taken notice of by Waltherus (*y*); when the neighbouring parts are greatly affected, it is not very unusual, for the bladder to be drawn into consent, and not expel its contents, so that Sennertus (*z*) recounted this among the signs of inflammation of the intestines: and indeed Cælius Aurelianus (*a*) plac'd, formerly, among the rest of the evils that attended the ileos, "a total suspension of the offices of the bladder and belly." But of the suppression of urine I shall speak hereafter.

Now let me subjoin to these two observations of Valsalva's some of my own.

9. A young man whose occupation was that of a husbandman, had had a rupture of the intestine into the scrotum, in the right side, but as the intestine, was remov'd from thence, replac'd, and retain'd, by means of a bandage, or truss, he suffer'd no injury from thence till the use of that retentive bandage was omitted. This however being at length omitted, it happen'd, after he had been troubled with an intermitting fever, for about two months, and had lately fill'd himself with hard flour dumplings and other gross food of the same kind, that the intestine fell down again, into the same place. And from that very day, which was the last of October in the year 1705, he began to be seiz'd with a vomiting of a bitter matter. On the fourth day of the disease, a singultus came on, and a pain of the scrotum. A fucus of warm lixivium being applied to the scrotum the pain seem'd to be somewhat alleviated. But as the vomiting and the singultus continu'd, and he was, besides, troubled with pains of the belly, and a thirst, he was brought, on the sixth day, into the hospital of St. Mary de Morte at Bologna.

But there the hand of the surgeon was not of any advantage; and the remedies of the physician gave only a little alleviation. For the singultus was

(*u*) Dec. 1. obs. anat. 5. §. 9.

(*x*) Advers. 4. animad. 3.

(*y*) Dissert. de collo viril. vesicæ &c. §. 3.

(*z*) Medic. pract. 1. 3. p. 2. f. 1. c. 2.

(*a*) Acut. pass. 1. 3. c. 17.

remov'd, as the vomiting was also; but the latter only for a short time, when the *emplastrum de crusta panis*, as it is call'd, was apply'd to the region of the stomach, and a glyster was thrown up made of the oils of linseed and violets. I first saw him on the seventh day. There was a slight pain in the scrotum. I heard that the pulse was less frequent, than it had been the day before: but it was lower, and more weak, than was suitable to so young a man. His thirst still continu'd. Nor did he discharge any fæces, except when the oils I have mention'd were injected.

And, indeed, after they had, on this very day, made use of a carminative decoction, as it is call'd, by way of glyster, to which some clarified honey was added, with two drams of the electuary, that is known by the name of *benedicta laxativa*; the vomiting of bitter matter return'd, in which there was a round worm; but the glyster did not return till after many hours. On the eighth day, another worm was discharg'd. The abdomen being tense, and resounding, as it were, under the hand, after the manner it does in a tympanites, which I had also observ'd the day before, it did not suffer any pain from pretty rough handling, not even in the epigastrium, where the patient felt a kind of little biting pain. When I ask'd him whether he felt any heat likewise, he answer'd in the negative. The pulse was, in other respects, similar to that of yesterday, but much more frequent. His tongue was dry. His urine had a saturated colour. Under his eyes was a lividness, and, even without this, his face had a very unfavourable appearance. The night following was restless.

On the ninth day, every thing was in the same state: the countenance and pulse were even worse. For the latter was still more frequent, but when you press'd it, it gave little or no resistance. And the former was nearly of the same kind with that which you call the facies Hippocratica. And though the patient had been troubled with an anxiety on the preceding days, had a feeble and lamenting tone of voice, and was every now and then changing the situation of his body and his limbs, yet all these symptoms were still more remarkable on this day. For, besides a pain which continu'd constantly in the whole belly, the sensation of biting, as it were, recurr'd at times, in every part, but particularly in the epigastrium. There was no pulsating pain, for this I particularly ask'd, nor any pulsation in any part. Nor was the pain, which he felt in the scrotum, or in the neighbouring part of the belly, in these last days, of any great moment.

However, when I felt the pulse, I found that the skin was really rough, and dry, and yet not hotter than was to be expected. Having taken some food, he found himself a little better. He also said that he had been reliev'd by the glyster of oil, that had been given him the day before, and this he had also said, at the time of its being given. But on this day another being thrown up, of broth in which the seeds of coriander had been boil'd and sugar, he threw up the food he had taken while the glyster came away. In the evening he slept. Being ask'd after his sleep how he was, he answer'd that he felt a strange kind of pulsation in the epigastrium, and that there was some sense of heat in the belly. In the mean while, he was troubled with a vomiting of a more fluid matter, than he had been heretofore, which was at intervals, also, of a yellowish colour. And this vomit-

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ing continuing through the whole night, together with the rest of the symptoms that I have mention'd, he expir'd in the morning, that is on the tenth day of the disease.

The belly contain'd a great quantity of extravasated matter, of the same kind with that which had been thrown up by vomiting: and the stomach, and small intestines, were very much distended with the same, quite to the hernia: but in the whole of this tract, was no more than one worm, like the two others which had been thrown up by vomiting. The large intestines were empty, white and found. The stomach was also found. But the adjoining intestine, which receives the biliary and pancreatic duct, was so livid, in consequence of inflammation in that part, that it had already a gangrenous smell. An inflammation more slight, and not yet livid, affected the jejunum in several places, and the much greater part of the ileum. For the remaining part, I mean that which lay most contiguous to the colon, was affected rather with a gangrene, than with an inflammation, as the description of the hernia will shew.

The sacculus was of the form of a pear, and consisted of a coat, which was not less thick, and firm, than the pulmonary artery. It was cover'd not only by the scrotum, and the dartos, but also by the cremaster muscle, and with that membrane, upon which this muscle lies, in common with the testis, and the vessels that go thereto. The testis was under the sacculus, and the vessels adher'd externally, on the internal side, and went to the belly, near to the orifice of the sac, but not through that orifice. This orifice was like a pretty thick ring, which the peritonæum; and the surrounding tendon, form'd: and it admitted, besides the intestinum ileum, and a small part of the mesentery, which was annex'd to it, the omentum also, of which I, for that reason, had seen scarcely any part covering the intestines, on the left side, because it was drawn towards the right side, to the hernia: nor did it only go down to the fundus of the sac, but forming itself into a round body, which I should not have known to be made up of the compress'd substance, of the omentum, if I had not cut into it, return'd up again from thence, and connected itself to the intercepted ileum, not far from the orifice of the sacculus.

But whatever part of the omentum was contain'd in this sacculus, I found connected thereto, by a redish kind of body, that was interpos'd, and was flaccid in its substance, so that it could easily be separated from the omentum, and the sacculus; nor did it seem to be any thing else but membranous cells, full of serum and blood. The ileum, however, was neither connected to the sacculus, nor did it reach to the bottom of it; but curving itself in the manner of an arch, a little below the orifice, it return'd into the belly, by the same way it had come down; so that if you dispos'd it regularly, you would find that no more than four or five inches of the intestine was intercepted. All this part was affected with a gangrene, and of a black colour; but still much more so, where it was constring'd in the orifice of the sacculus: and the circumference of this orifice was no less black and foetid, as the neighbouring upper part of the ileum was; and this was even so tender, or rather rotten in its substance, that it could not support the force of the humour, which distended it, but being perforated with one

foramen of a pretty considerable size, pour'd out its contents by that way, into the cavity of the belly. Among the remaining viscera of the belly, which, as well as the intestines, were as yet considerably warm, notwithstanding it was thirteen hours after death, before the body was open'd, the liver had also contracted a disease; for it was black on its edge, and on the hollow surface, together with the gall-bladder, which was of a moderate size, somewhat black.

In the thorax every thing was found, although in the right ventricle of the heart, there was a polypous concretion, of a yellowish colour, and soft; which extended its almost-white appendages from thence, quite into the jugular veins.

10. In regard to the many things that might be observ'd here, some I shall hint at more properly below, and others I shall touch upon, as soon as ever I have given you another observation, which I took about four months after the former, in the same hospital.

11. A woman of more than fifty years of age, who had already labour'd under two herniæ, for the space of two and thirty years, both of which were on the left side, one at the navel, and the other at the pubes, having, by chance, fallen from a place that was not very high, was not at all hurt by her fall, except that she receiv'd a contusion about the top of the scapula and the shoulder bone. From this contusion she easily recover'd, but in the mean while, began, at the interval of a few days after her fall, to have a very great costiveness, and a little after to throw up, by vomiting, a yellowish, and fluid matter, which had exactly the same smell, as the excrements, discharg'd from the rectum, generally have. The vomiting came on at different times, but more particularly two or three hours after food had been taken in. The pulse was neither frequent nor devoid of resistance, when press'd under the fingers; it was extremely small, especially after vomiting, and grew less every day. As glysters were of no use, mercury was given twice, to the quantity of two drams, the first time without any effect, but the second time with such an effect, that the patient had three stools, solid excrements being discharg'd the first, and the second time, and the third time fluid. Nor did it seem that this remedy had done any mischief. Yet the woman died about twelve hours after taking mercury the second time, on the fourth, or fifth day, after the vomiting had begun, and half an hour after the time in which she had last vomited; whereas, through the whole course of the disease, she had neither labour'd under any evident fever, nor convulsion, and had born the pains of her belly with so little complaining, that I have no remark made upon them.

When the abdomen was cut into, and its cavity laid open, a very strong smell of putrefaction issued forth. The intestinum jejunum, and the neighbouring part of the ileum, were universally distended with the same kind of matter, which had been thrown up by vomiting. But the remaining part of the ileum, and the large intestines, were contracted. The jejunum being distinguish'd, in some places, with lines of a lively red, and in a longitudinal direction, was in other parts of a brown colour, mix'd with red, as the ileum was likewise, almost in every part. But I found this last-mention'd intestine, not far from the jejunum, to be much more considerably affected, to

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the extent of three or four inches; which was the very part of it, that together with the annex'd mesentery, went down into the sacculus of the lower herniæ, curv'd into the form of an arch. For although this prolaps'd part of the intestine, was neither connected to the sacculus, nor to the orifice of it, which resembled a kind of ring, as it were, yet being seiz'd with a gangrene, it was of a bloody colour inclining to black, and wept a bloody serum from its surface. However, no intestine, but only a part of the omentum, enter'd the upper hernia, which when look'd upon externally, was divided into two little mountains, or risings, as it were, and internally it was made up of one sac, into which the peritonæum had been extended.

As, besides the intestines, we look'd over the other viscera of the belly; for the thorax and the head were not open'd; we observ'd the liver to be somewhat hard, the spleen lax, and externally livid, but only in some places. The ligaments of the uterus were black: but the uterus itself was very small, and its parietes were very thin. And these being cut into, the substance of them appear'd to be so livid in the middle, that it seem'd to be inclin'd to a gangrenous state. As I had observ'd the uterus to be seated a little lower than usual, it came into my mind to inspect the vagina, that I might see how low the uterus had fallen down, into that cavity. And it happen'd, that no sooner had I laid the labia aside, and discover'd the orifice of the vagina, but a certain body appear'd to be pushing forwards, which at first any one might have taken for the os uteri. But as I had, just before, seen the uterus not to be in so low a situation, that if it were even extremely large, it could have reach'd thither; I dissected that and the vagina, immediately after taking them out of the body, and found the glandular body of the urethra to have become so thick, and to have drawn the vagina, which was in other respects lax, and without any rugæ, downwards in such a manner, that the extremity of it, which is perforated to make an orifice for the urethra, might easily be taken for the os uteri falling downwards, and easily impose upon a surgeon who was not well-experienc'd, not to mention that it might easily impose upon a midwife.

12. But these last circumstances relate to another subject. Let us now attend to what relates to the present. As to the woman's having scarcely complain'd of pains in the belly, and being without a fever, through the whole of the disease, do you think that these circumstances can be accounted for, from supposing the iliac passion to have been produc'd in her, "by reason of the expulsive faculty being abolish'd," as Salius says (*b*); or by reason of "an atonia, or loss of tension, from the nerves of the intestines being obstructed," as the opinion of Ruysch (*c*) is? The former of these authors says, that such is the state of the case, "when attended with no pain;" and the latter did not at all doubt, but for this reason it was, that the ileos, in a certain woman, had been attended "with no remarkable pain or fever."

But not to enquire now, into what we shall see below (*d*), whether, when the intestines are in such a state, the several contents thereof can be thrust back, and driven upwards, into the stomach, so as to be thrown up by

(*b*) C. cit. supra ad n. 1.

(*c*) Obf. anat. chir. 91.

(*d*) N. 30.

vomiting; and not to discuss this point, whether the other signs of that constitution, which Salus enumerates, did really exist in the woman whom I have describ'd, it is past a doubt, that neither Salus, nor Ruysch, suppose an inflammation of the intestines to exist at that time; for both of them mention this separately, and the first of them expressly supposes, in case of inflammation "a fever, and together with it, violent pains, whereby the patients are violently excruciated." Is it possible then, that there could be an atonia in the intestines of this woman, where it is manifest there was, at the same time, an inflammation? Be this as it will, it was certain that none of the many causes of this disorder, which Salus enumerates, had preceded. But in regard to the question, whether a fever may sometimes be absent from an inflammation of the intestines, I shall have another opportunity of determining that hereafter (e).

13. But now if we consider what are the consequences of inflammation, in the two histories I have given you, it will be easy to conceive, how much it behoves every physician, whose intention it is to prevent the progress of this disease, to admit of no delay; and what remedies he ought to be suspicious of, when the disorder has already made some progress, leaden bullets, for instance, and mercury. For if the intestines, being rotten from sphacelation, as in that young man, who was a husbandman (f), do not resist even the matter which they contain, we must beware of increasing their contents, by suffering the patient to take in more than is absolutely necessary, and still more must we be cautious, how we make him take in the most ponderous substances, which would open a passage for themselves, through the substance of the intestines, instead of opening the natural passage, and by this means accelerate death. And this happens much more easily, where there is, at the same time, such a constriction of the intestine, as suffers nothing to pass through it, till the intestine is replac'd.

For the same constriction, by vitiating the intestine that lies immediately above, renders it unequal to supporting the distention, and the weight; and, at the same time, the matter which distends, and loads it, is obstructed, in that very place, where the intestine is most weak, and diseas'd. But yet Hoffmann (g), you will say, sav'd a woman in a volvulus, from the intestine being intercepted in a bubonocoele, by giving quicksilver to the quantity of half a pound; although those are not wanting who think this case almost incredible. To me, however, it seems the more credible, because Alphonsus Khonius (h) had, long before, remov'd the same disorder in a man, from an intestine being intercepted in an oscheocoele, or scrotal hernia, by giving him nine ounces of quicksilver. But altho' the symptoms, in both cases, were violent, yet the constriction of the intestine might be less, and it is certain the disorder had not yet proceeded to a sphacelus: as it is, likewise, certain that this was not the case, in the great number of patients who, as we read in several authors, were cur'd of a volvulus, by taking even a much greater quantity of this metal.

In respect to those patients then, in whom the intestines are as yet firm, and strong, I had never any fear of this kind; for it first arose from seeing the

(e) Epist. 35. n. 20.

(f) N. 9.

(g) Medic. rat. t. 4. p. 2. f. 2. c. 4. obs. 3.

(h) Eph. n. c. dec. 3. a. 9. obs. 79.

state of the intestines, in that husbandman, when dissected, which put me on supposing how much the intestines might be weaken'd in others, also, when the disease was much advanc'd. And I wonder'd, from that time, to this very day, on which I revis'd this letter, that I had, to my knowledge, lit on no writer in practical medicine, who, when he spoke of this remedy, against the disease in question, as most of them have done, gave us the least warning of this probable danger, besides one whose opusculum (*i*) I have lately read, I mean that eminent physician Mead, who very seriously admonishes us, "that we ought not to delay long" the use of quicksilver, in the ileos, if other remedies are of no advantage, "because it is to be fear'd, lest a gangrene should succeed the inflammation, as frequently happens, by which the coats of the intestine, being corrupted, suffer the ponderous metal to escape through them, into the abdomen."

Nor do I suppose that you would think of objecting to this caution, the observation of the celebrated Wahrendorff (*k*), which relates to the history of a patient with an iliac passion, in whom half a pound of quicksilver, which had been given, had reach'd quite to the colon, and had not burst through the corrupted stomach, or the duodenum, which was affected with a sphacelus. For as the patient died "three days after" he had taken the mercury, you easily perceive, that in this space of time, the inflammation, which was still in the jejunum, and the ileum, might have degenerated, in the duodenum, and stomach, into a sphacelus, which did not exist before. And I suppose you would make use of much the same kind of answer, if any one should object the observation of Schroekius (*l*), who in a patient that died of an obstinate obstruction of the bowels, found about two pounds of quicksilver, at the beginning, and termination, of the intestinum ileum, and saw it adhering to the coats of this intestine divided into very minute particles, without these coats having been perforated thereby, notwithstanding the intestines were not inflam'd indeed, but so extremely weak, that, being handled a little roughly, they were burst through "in several places." For there were more than twenty days betwixt the last time of taking the mercury, and the patient's death, so that the intestines being distended with air, and with fæces, they might, at length, become corrupted, in the latter part of the time; nor is it certain whether they were, in fact, thus rotten in those places, also, in which the quicksilver had stagnated.

14. You will perhaps ask, why in the patients whom I have describ'd, the intestine was not replac'd? And why, as it was not replac'd, a part of the contents, nevertheless, escap'd from the small, to the large intestines, in some of the cases. In regard to the first enquiry, suppose that some were brought into the hospital, much later in the disease than to admit of this operation, that others were brought in early enough, but at that time, when scarcely any of the surgeons, in the greater part of the cities in Italy, were daring enough to make use of the knife, in order to lay open the narrow passages, which prevented the intestines from being replac'd, by any other means.

In regard to the part of the matter contain'd in the intestines having pass'd

(i) *Monita medica* c. 7. f. 2.

(k) *Act. n. c. t.* 3. obs. 131. ante fin.

(l) *Eorund. dec.* 3. a. 5 & 6 obs. 299.

through these narrow passages, in some patients, I would first have you observe, that the *fæces*, which I have said was discharg'd by means of glysters (*m*), had been below the place of constriction, before the intestine was constring'd; and that it may happen in volvulous patients, not only by the assistance of art, but by the help of nature, that the contents of the intestines, which are below that part, may be discharg'd, Salius (*n*) has confirm'd, in opposition to the common doctrine at that time, not only by reason, and his own experience, but by the experience of Hippocrates (*o*) also, in the woman who lay ill at the house of Tisamenus, except that he asserts this to happen, while the disease is coming on, and not when it is already form'd.

But in the woman whom I have describ'd (*p*), it is evident that this happen'd near the close of a mortal disease, and that not only the contain'd matter which was below the constricted intestine, had been, more than once, discharg'd by stool, but finally, perhaps, even a part of that which lay above the constriction, and especially the mercury; unless you should suppose that this remedy given in its simple state, in a very small dose, and without any purging medicine being join'd with it, had a power of propagating I know not what irritation through the intercepted *parietes* of the intestine, which were not yet seiz'd with a *sphacelus* indeed, but were affected with a *gangrene*. Yet as this is not easy to suppose, it will seem very probable, that the intestine was less closely constricted in this woman, than in the young husbandman (*q*), so that the weight of the mercury, assisted by the change of situation in the body, by the agitation of vomiting, and by the pressure upon it, might have been able to pass through that short tract of the intestine, and after that, by the help of the sound intestines, promote the discharge of the matter which was contain'd below the constriction. But I will now give you one of those examples, in which the intestines did not cease to make some little discharge, through the whole course of the disease.

15. Mary, the wife of Antony Franciscati, a carman at Padua (for the very extraordinary number of valves, that I found in the pulmonary artery of this woman, made me enquire, very particularly, into her name, and other circumstances relating to her) aged thirty-nine years, of a moderately good habit of body, not a bad colour, and much less of an *icteric* complexion, having had many children, the last of which she had given suck to for six months, when she was seiz'd with this fatal disease, and having been subject to no other, except a little femoral hernia, from which this last disorder, at length, had its origin, and which she, having been accusom'd to replace of herself, whatever part it was that fell down from the belly, had attempted to replace now, likewise, for several days together, but not being able to succeed, was seiz'd with a fever and vomiting, and the other symptoms which generally attend this disorder, except that she could always make some little discharge by stool. She was at length brought into this hospital, much later than she ought to have been, where, though to all appearance she was like a person who was about to die very soon, she nevertheless drag'd on her

(*m*) N. 9.

(*n*) C. cit. supra ad n. 1.

(*o*) Epidem. l. 3. f. 2.

(*p*) N. 11.

(*q*) N. 9.

life, for many days together, and even on the last of them, seem'd to be somewhat better, and to be eas'd by the glysters which were thrown up, till, at length, on the twentieth day of November, in the year 1704, she died.

The belly being open'd the day afterwards, and the hernial sacculus, at the same time, laid bare, which was thick, and easily divisible, into many laminæ of coats, as it were, it was observ'd to be quite disjoin'd from the ligamentum teres of the uterus, but connected to the crural vessels, to which it lay contiguous, on the internal side: nor had it a narrow orifice; but all the confinement which the hernia suffer'd, was owing to the lower border of the external oblique muscle of the abdomen, that lay upon it, which border is call'd the ligament of Poupart, or, rather, the ligament of Fallopius; whereas it is in fact only the tendon of that muscle (*r*); in which opinion very skilful men agree with me, and amongst these Heister (*s*), and if you read him attentively, Platner also (*t*). Under this border then, was intercepted some part of the neighbouring intestinum colon, yet in such a manner, that a passage remain'd sufficiently open through it, only the paries thereof was shut up, which had lain in contact with the orifice of the sacculus. This paries, cohering with the sacculus, was black and corrupted; and the nearest part of the intestine, which lay without the sacculus, was green.

The internal parietes and the belly were green also, and smell'd very strong in most places. Yet in the viscera of this cavity, I remark'd no morbid appearances, except in the gall-bladder, which was somewhat larger than it ought to be, and with a bile, that was not of a black colour, contain'd sixteen calculi, which scarcely differ'd from each other, in magnitude, being all of them small indeed, but not very small, externally yellow, and made up of many smooth surfaces. And having apply'd one of these calculi to the flame, in the moist state, in which it then was, I saw that it burn'd, not without sparkling, and melted, but that it did not cherish and preserve the flame.

As we dissected the remaining part of the body, on the same day, and on the following days; for the other viscera were very proper for demonstration, and the muscles were extremely red; nothing offer'd itself to our observation, in any other part, which can be suppos'd to relate to the present subject, except that in the medullary substance of the brain, were a great number of bloody points, and a great quantity of blood, which gave rise to these, as both the venæ cavæ, and the veins that flow into them, and especially the vena azygos being distended therewith, signify'd; and the whole left lobe of the lungs was, on one side, connected to the pleura, and on the other, to the mediastinum, and, finally, the thyroid gland was somewhat thicker than it naturally is: although many other circumstances occur'd which are not unworthy of being notic'd in another place. One of which I will not pass over at present, as it had never before occur'd to me, nor had I ever heard, or read, that it had been seen by any one, nor did I even hear afterwards, from very learned foreigners, who came with great politeness to visit me. And this was the reason, why, in pointing out some of my observati-

(*r*) Advers. anat. 3. animad. 1.

(*t*) Instit. chir. §. 793.

(*s*) Compend. anat. not. 4.

ons, to the celebrated Morand (*u*), in as few words as possible, as my custom is, and particularly passing over the rest, as they had been made by others, as well as by me, I excepted this one.

That is to say, in a woman, who had been subject to no disorder, which related particularly to the circulation, and had reach'd to the age which I have mention'd above; and in whom, every minute part of the heart, and the adjoining vessels, being accurately examin'd by me, shew'd no diseas'd appearance whatever, nor any thing preternatural, I found at the orifice of the pulmonary artery, instead of three valves, four valves, and demonstrated them to a crowded circle of learned men, and of students who were present, being similar, in their appearance, to those that are generally found there, except that one was in every dimension considerably larger than usual, as when you come hither, you shall, some time, or other, see; for I still keep them preserv'd in a proper liquor: and this was seated anteriorly, and towards the left side, in respect to the others. But when I revis'd this letter, I was pleas'd at my having said above, that this was a very rare observation, indeed, but not that it was the only one. For, at length, among that great number, and variety, of observations, which are publish'd by the celebrated Jo. Zacharias Petſche (*x*), as being taken in concert with his preceptor Casſebomius, I lit on one of another woman, in whom "the pulmonary artery had four valves, that is to say, three large ones, but the fourth a less." We also read that the aorta, of this woman, had sent off no more than two branches upwards; but how many years she liv'd, what health she enjoy'd, and of what disease she died, is not added.

16. But leaving an appearance which, any where else but in the heart, where nature is generally found to be so similar to herself, would not have deserv'd any great attention, I return to the consideration of the hernia, which though very small, was nevertheless fatal. And, indeed, in proportion as herniæ are neglected by patients, on account of their smallness, so much the more dangerous do they often, at length, become, as that was, the sacculus of which "would scarcely admit the extremity of the fore finger (*y*). For the intestine is more easily conglutinated with a small sacculus, and more closely constring'd thereby. And to this must be added, the silence of the patients upon this head, by reason of the neglected smallness of the hernia, even when they begin to be tortur'd with pains of the belly; so that the celebrated Werlhof (*z*) prudently admonishes all medical practitioners, "not to omit, in all colic disorders, to inquire into herniæ, which are often even very small, and overlook'd by the patients themselves, or conceal'd through shame;" and he relates, that to him, at least, it had happen'd more than once, that notwithstanding he had made the inquiry again, and again, the patients denied it, almost quite to the last.

It happen'd to me, also, in the case of a young man, who was equally learned, noble, and pious, and who is now a very eminent man, that when by other physicians, and by me likewise, it was much inquir'd, what could be

(*u*) Hist. de l'Acad. r. des sc. a. 1741. obs. anat. 7.

(*y*) Vid. act. lipf. suppl. t. 1. f. 12. in relat. libelli launay.

(*x*) Dissert. qua Sylloge anat. obs. &c. §.

(*z*) Commenc. litt. a. 1735. hebd. 1. n. 3.

the cause of pains in the belly, that return'd every now and then, and the more we inquir'd, the less were we likely to find it out; it happen'd, I say, that from this very absence of all other causes, I suspected the presence of that cause whereof we now speak. And that this suspicion was not groundless, I found out by inquiring whether he receiv'd any advantage from a supine situation of body. For as the patient answer'd in the affirmative, and as a little tumour was soon after found which he himself, by reason of its smallness, had not in the least observ'd, the intestine was replac'd soon after, and kept up by a proper bandage, so that the pains return'd no more. But these pains had been rather troublesome, than violent. And that colic pains, as I had begun to observe, are often brought on by herniæ, is not only shown by frequent experience, but confirm'd by the dissection of a woman, given by the celebrated Weiffius (*a*), who had been often troubled with colic pains, on account of a hernia, in the same place, where I have said our patient had one, and not only containing a portion of the colon, but a portion of the ileum, and omentum also; the gall-bladder being, likewise, loaded with a greater number of calculi, than it was in the woman describ'd by me.

The hernia of this woman may be call'd rare, as Littre says (*b*), if it be compar'd with those very frequent herniæ, that are made up of the small intestines. He describes one, in a noble-woman, similar to this of ours, whether you consider what he found in dissecting the dead body, or the power of discharging some excrements, which he had observ'd in the living body. Only the seat of it was higher. Another is taken notice of by Palfin (*c*), who seems not to have read that of Littre, I say that of the year 1714. But he had read the observation of Hildanus (*d*), which, when the author himself had accurately consider'd it, he had explain'd in the same manner as Littre (*e*): and I even find that Bienaïsius had thus explain'd another, which he met with at Paris also, in the year 1671, as J. H. Lavaterus, who was present, publish'd in the following year (*f*). For the reason why a female patient, labouring under a bubonocoele, "had discharg'd liquid excrements from the intestines, through the whole time of the compression (quite to the seventh day) was found by the operator," says he, by whom he means the gentleman I just now mention'd, "to be, that the intestine was, in part only, constricted."

But I have even remark'd of Ballonius, when saying (*g*), "that when the apophysis of the intestinum cæcum is prolaps'd into the groin," notwithstanding it may become putrid, "it is not necessary that those symptoms should, of course, follow, which are generally the consequences, in a similar affection of the other intestines, whether small, or large;" I have remark'd, I say, that when he says these things, he has pretty clearly hinted that if a prolaps'd part, either of the small, or of the large intestines, similar to that appendix, be intercepted in a hernia, the patient may have some discharges by stool, contrary to what happens when the whole tube of any intestine is intercepted. And it is certain that there are some other appen-

(*a*) *Commerc. cit.* a. 1745. hebdom. 24. n. 1.

(*b*) *Mem. de l'Acad. r. des sc. a.* 1714.

(*c*) *Anat. du corps hum. tr.* 1. ch. 8.

(*d*) *Cent. 1. obs. chir.* 55.

(*e*) *Cent. 6. in obs.* 71.

(*f*) *Diff. de intestinor. compress. thes.* 6.

(*g*) *L. 1. consil. med.* 103.

dages now and then, besides that natural one, which are also call'd diverticula, and that they enter the hernial sacculus, whether they are gradually and preternaturally produc'd, or are given to some bodies from their first origin. For I would have you be cautious of supposing that they are all preternatural, and especially that they were all form'd from the side of the intestine being prolaps'd into the hernial sacculus; for sometimes, as will be said below (*b*), they belong to those intestines which are not situated in the places where herniæ happen.

Wherefore, you will, without doubt, be of opinion with Littre (*i*), and Mery (*k*), that those appendages, which they saw, were form'd in that manner, or at least increas'd: and if you also choose to suppose, that those three which were seen by Schrockius (*l*), in a young man, who had been often troubled with pains in his belly, but not from herniæ, which were nowhere found, took their origin, or increase, from some morbid cause, I shall, perhaps, not very violently oppose your opinion. But if you should assert that some others, as, for instance, that which is describ'd by Weitbrecht (*m*), in a woman, which was furnish'd with conspicuous fibres, in the same manner as the other intestines, did not exist from the first formation of the body, I certainly shall not be able to assent to your assertion.

For I do not doubt but this was of the same kind with that which I found in an old woman, inasmuch as that had the same substance, and thickness, of parietes, with the other intestines, and hung perpendicularly from the ileum, where it was nearer to the colon, than to the jejunum: and this I would have you add to my very short description in the *Adversaria* (*n*), since Hunauld (*o*), when describing another which had been seen by him, has desir'd that this should not be pass'd over. And perhaps that was nearly of the same kind, which I saw in the woolcomber (*p*), though it differ'd from the former in these circumstances, that it was shorter, and hemispherical, in its figure, and plac'd contrary to the insertion of the mesentery, where the ileum was so reflected, as to make an angle, which continu'd even when the mesentery was cut off; for in that the very prominence of the angle was protuberant, much in the same manner, if you consider the situation only, as that which is delineated by Ruysch, in the *Musæum Anatomicum* (*q*). Those which I have seen besides, I have not a description of, and indeed have seen but very few, though I have examin'd the intestines of so many bodies.

17. And from hence it is, that the more I consider, the more I suppose that the words of Ruysch, in the seventh *Thesaurus* (*r*), "diverticula of this kind" "are generally, if not always, to be met with in the ileum," are to be taken in a different sense from what they seem at first to convey; I mean, in fact, that when they are really found, they are generally found in this intestine. At least in this intestine they have been seen, by those who are mention'd by

(*b*) N. 17.

(*i*) Mem. de l'acad. r. des sc. a. 1700.

(*k*) Mem. a. 1701. obs. 1.

(*l*) Eph. n. c. cent. 8. obs. 50.

(*m*) Comment. acad. imp. petropol. t. 4.

(*n*) III. animad. 5.

(*o*) Hist. de l'acad. r. des sc. a. 1732. obs. anat. 2.

(*p*) De quo epist. 36. n. 22.

(*q*) Fig. 3. ad thec. c. reposit. 3. n. II.

(*r*) N. XV. 3.

me at present, or have been mention'd before (*s*), and besides these by Henricus Meibomius (*f*) formerly, and after that by others, and among the rest by those very experienc'd men, Waltherus (*u*), Schlitingius (*x*), and lately by the celebrated Bonazoli (*y*); to say but little of myself, who nevertheless, not to omit this circumstance that relates to my own observations, very well remember that the bodies, in which I saw these appearances, had not been those of maniacal persons, nor do I ever remember to have seen them, in the bodies of maniacs, that I have happen'd to dissect. I have also seen the same appearance, more than once, in geese, and particularly in one of such a breadth, that it could not be taken for the remains of that duct, which had formerly belonged to the vitellum. And in these creatures, likewise, it communicated with that intestine, which answers to the ileum, and even with the part of it, that is nearest to the large intestine; which I see has happen'd in the human body, both to me, and to others, who have expressly told us, to what part of the ileum, they were connected.

From hence a confirmation may be taken, of the cause pointed out by the celebrated Fabricius (*z*), why morbid appendages happen chiefly in the ileum. For if the intestinal contents, which descend to the ileum, from the parts above, by reason of the greatest part of the chyle being already taken up into the lacteal vessels, begin to acquire so "very thick a consistence," as to urge the thin coats, and distend them; this consistence will certainly be thicker and thicker, the greater progress these contents shall have made, through the ileum, as, by this means, they will have parted with still more chyle, or any other fluid that was mix'd with them. Wherefore the diverticulum, also, which he saw, was not more than two spans distant from the extremity of the ileum. What then, you will perhaps say, are we to understand Ruysch so as to suppose, that these diverticula are sometimes to be met with in other intestines, in like manner? Without doubt: for when I read over my observations, I cannot help believing that it happen'd to him, sometimes, much as it happen'd to me, when I saw an appearance of this kind, once in the rectum, and again in the duodenum. This appearance in the rectum, I have describ'd in the *Adversaria* (*a*); and it was in the body of an apoplectic man, that I saw a diverticulum connected to the duodenum, almost two inches below the pylorus, which was a kind of cellule not very protuberating, but big enough, in its orifice, to admit a finger, surrounded with no coat, but the external one of the intestine, yet having not the least traces of any present, or past, ulceration in that part, as indeed there were not in the stomach, or the whole intestinal tube.

But as these diverticula, when they do exist, are chiefly to be met with in the ileum, as I have said, which is the longest of all the intestines, and plac'd in that part where herniæ do most frequently happen, it is not to be wonder'd at, if they enter into herniæ chiefly from the ileum.

And then Ruysch thought it might happen that no symptoms of a hernia should follow (*b*). And Littre (*c*) had, before, expressly taught, that all the

(*f*) *Advers. III. animad. 3.*

(*f*) *Epist. de vas. palpebr.*

(*u*) *Progr. de aneur.*

(*x*) *Act. n. c. t. 6. obs. 20.*

(*y*) *Comment. de bonon. sc. acad. t. 2. p.*

14. *inter anatom.*

(*z*) *Progr. helmstadt. editum janu. 1750.*

(*a*) *Animad. cit. 5. in fin.*

(*b*) *N. 3. cit.*

(*c*) *Mem. de l'acad. r. des sc. a. 1700.*

symptoms of herniæ, of this kind, proceed more slowly, and are less violent, than in other herniæ, where the whole tube of the intestine is strangulated, and that they are particularly distinguish'd by this circumstance, that a discharge of the fæces is never impeded. And he adds other things, in which are these also, that the abdomen is neither tumid, nor tense, nor fill'd with flatus, as in common herniæ. Which circumstances, although they seem to be agreeable to reason, on account of the passage through the intestines being then free, and are very properly confirm'd, by the approbation of Palfin (*d*), and of others, are nevertheless not always to be depended upon, as indeed no maxim, whatever, in medicine is so well settled, but it may sometimes mislead us; and in order to evince this, I will, here, add an observation of my own, which I have indeed, already, just hinted at in the Adversaria (*e*), but not wholly describ'd; for from this it will appear, how very different the case was with a patient, in whose hernia a part of the intestine was so intercepted, as still to have an open passage left through it.

18. A porter of Bologna, who was so far broken down by continual labours, and fatigues, that when he was in his fiftieth year, he appear'd much older, had a hernia in his right groin, of the bigness of a man's thumb, which sometimes seem'd to be remov'd. This man, about the middle of March, in the year 1706, without any previous cause, except perhaps that a snowy day had come on, all of a sudden, after very temperate weather, was seiz'd with a pain of the belly, which was vague indeed, but very severe, and, as his own expression was, just as if he were gnaw'd by dogs. And this pain, although it seem'd to have grown much milder, by applying I know not what kind of ointment to the belly, yet soon after grew more violent than ever, and was never afterwards diminish'd. As the man was brought into the hospital of St. Mary de Morte at Bologna, when the disease had already continu'd six days, his flesh was almost cold, his pulse was very frequent, but still small, and gave little resistance to the fingers which press'd it, and struck them with an unequal force of percussions, his whole abdomen being distended like a drum, but more below the right hypochondrium, where some cells as it were of the intestinum colon seem'd to be felt with the hand, and the hernia being become much harden'd in its substance, although he denied that this was the principal seat of the pain. He threw up his food. For four days he had discharg'd no fæces at all, from his intestines. It was even in vain that he endeavour'd to discharge the flatus itself.

Fresh drawn oil of almonds was given him; and linseed oil thrown up by way of glyster to the quantity of ten ounces. The latter return'd just as it went up, and the former he threw up from his stomach, and complain'd that he was disturb'd, and agitated thereby. Being ask'd what taste he had in his mouth, he answer'd that of poison. He was very thirsty. His vomiting continu'd. On each of the following days, that is on the seventh, and the eighth, a glyster was thrown up, the first compounded of the *benedicta laxativa* and other ingredients, and the second of milk and the white of an egg; but they were of no more use than the former. As no excrement at all was dis-

(*d*) C. cit. supra ad n. 17.

(*e*) Animad. ibid. cit.

charg'd, and the other symptoms, which I have describ'd, continu'd, and the pulse, although after the sixth day it was no more unequal, became more weak, and smaller, so that on the ninth day we could hardly feel it at all, and as the skin was now corrugated, the body cold, and the patient unable to lift up his eye-lids, and almost to speak, notwithstanding he beg'd for wine, he sank by degrees, and, at length, on the night following, died in a very placid manner.

The body, which had a squalid appearance, the skin being rigid and not without some scabies, I dissected on the following night. When the abdomen was open'd, a smell came forth like that which generally proceeds from gangrenous parts. The omentum was extended quite into the hernia, and entirely red from inflammation, except some broad lines, as it were, which were drawn in a transverse direction. The spleen was, in some part of it, infected with a morbid livor, which was also carried to the internal part, although to a very inconsiderable depth. The stomach stretch'd itself much more to the right side, than it usually does, being universally distended with a yellowish matter, that resembled nothing more, than a fluid excrement, with which the small intestines, from the stomach quite to the hernia, were also distended, to a very great degree. For whatever us'd to be carried from the ileum to the large intestines, remain'd there, and was collected in great quantity; and the large intestines were all very much contracted, and white, so as to make it manifest, that nothing had pass'd through this part of the ileum which belong'd to the hernia; although the tube of the intestine, itself, did not enter the orifice of the sacculus, but passing by the side of it, sent no other part of itself into that cavity, but a portion of its paries, relax'd into the form of a femioval cavity.

The largest axis of this cavity, where it began gradually from the intestine was about three inches, according to the length of the intestine; and the least axis was much shorter, inasmuch as it extended itself through the anterior surface of the intestine, at the interval of a small inch from the insertion of the mesentery, to the inferior surface. From these beginnings, the cavity was more and more contracted by degrees, as the femioval figure requires, till it descended to the depth of a large inch in the middle. This part therefore, whether you choose rather to call it a cavity, or a diverticulum, was the only part of the intestine, intercepted by the hernia, together with the extreme part of the omentum, which was included with it, so that the remainder of the intestinal tube was not at all compress'd thereby. But neither of these parts could be drawn up from the hernia, as they were not only confin'd by the nervous orifice, as it were, of the sacculus, but even connected to the sacculus, by a kind of fibrous junction, that was not very strong, indeed, but very frequent; and the sacculus, in the part where these connections were, was somewhat rough, but in other parts smooth. This sacculus was made up of the peritonæum, relax'd towards the external surface of the body, and carry'd out near the external side of the spermatic vessels: and on one side, and on the other, of the hernia, were two tumid inguinal glands, one of which being very near to the sacculus, had its substance in part white. The intestine, in that part which was nearest to the sacculus, and still more the diverticulum of that intestine, was of a red colour degenerat-

ing,

ing into black. And the intestine from thence upwards (for below, as I have said, it was white, for a considerable extent) was of a red colour, inclining to livid: but the whole of the tube, from this tract quite to the stomach, was quite red, by reason of the great number of blood vessels, which were crowded together in most places. And the mesentery was of the same colour.

I chose also to open the thorax. The lungs adher'd every where, except on the right, and anterior surface, to the pleura, and particularly at the sides, and back, where this membrane was much thicken'd, but no where more, than at the upper part of the thorax, on the right side, where the substance of the lungs was extremely hard, as if from an old disease; and in the inferior part, and on the right side, likewise, it was considerably more compact than it generally is. However, the lungs abounded with moisture, almost in every part.

In the pericardium was no water, but the heart was flaccid, and contain'd polypous concretions, in each of its orifices, as it did in the right ventricle also, and the left auricle, all of them being moderately condens'd, and most of them of a small size: for that was the smallest which lay in this auricle; and that was the longest which reach'd into the pulmonary artery, and its branches.

19. I do not doubt but you will naturally enquire of me, why, notwithstanding the passage remain'd open through the intestine ileum, yet nothing pass'd through it. I confess I can suspect many causes, but can affirm none for certain. The intestine was, in that part, exceedingly injur'd by inflammation, and at the same time irritated, on account of a portion of itself having suffer'd distraction, and interception. Did the peristaltic motion, therefore, by which the contents were push'd on, cease in that place? Or was there some convulsion, by which, that part of the tube was contracted, in the living, more than in the dead body? Or finally, did inflammation cause this contraction, by rendering the vessels, and the parietes, more turgid, while life remain'd, which after death were relax'd? At least Littre (*f*) hints at something, which relates to this third cause, when he conjectures why by that noble woman, whose hernia took in a portion of the colon, sometimes frequent, and large, discharges were made from the intestines, and at other times less large and less frequent. Nor would I have you make it an objection, that in this woman, although the intestine was inflam'd, and a portion of it intercepted, more or less of the contain'd matter could always be carried through it, as in that woman, also, whose history I gave you under number fifteen.

For to omit, that in different persons there may be a different degree of injury, a different degree of power, in the intestines, and a different degree of sensibility; it is certain that in these women the question is of the colon, and in this man of the ileum, which, not to inquire whether it has more acute sensations, is at least more narrow, in many parts, than the colon; so that if even a larger portion, according to the breadth, of the latter than of the former, be intercepted, a more open passage will remain in the colon, and

(*f*) Vid. *supra* n. 16.

a larger extension of the parietes, in which the power of pushing forwards the contents consists, and with these also will remain those three ligaments, that is to say, those three muscular bands, which it is so much the less probable should be intercepted within herniæ of this kind, as it is the more difficult for the paries of the colon to be relaxed, in a part where it is fortified externally with one of them: and this external situation, and more compact substance of the fasciæ, or bands, may also have this effect; to prevent them from contracting a disorder so easily. And from these considerations you will perceive, not only why the diagnosis of herniæ of this kind, propos'd by Littre, may answer much better in the colon than in the ileum; but also why it will answer better in the ileum itself, where the orifice of the diverticulum is pretty narrow, such as it is describ'd (g) by the same author, not when it is so large as my description shows it to have been in the porter. I say answer better; for I dare not take upon me to say that where the orifice is thus narrow it will always, nevertheless, answer.

And these things you know I had written to you, when I receiv'd a book that was sent to me by the celebrated Benevoli (b), wherein he describes in the second place, a hernia made up, as was confirm'd by the dissection of the body, of an appendix of the ileum, extending itself into the scrotum. Which, although it communicated with this intestine, by an orifice that, in the dead body, was not larger than to equal the diameter of a small filbert; yet the patient had, for the first fifteen days of the disease, which was very violent, thrown up every thing he took in, by vomiting, and discharg'd nothing by stool, and had thrown up, very early in the disease, a matter like the fæces. Besides, the intestinum ileum, in the part which corresponded to the hernia, was, for some considerable length, of a colour that was not quite natural, and was very much corrugated and contracted; from whence it was easy to conjecture, that the intestine, being violently drawn down by the distended, and inflam'd, appendix, was, from this cause, attack'd with inflammation, depress'd, and convuls'd.

I would have you join this history with the history that I have given of the porter; and the conjectures which depend upon what was remark'd in the dissection, I would have you join to those things which I suspected, in regard to the causes why the diagnosis of herniæ, of this kind, which is given by Littre, may sometimes not answer. But if not only the appendix, but the ileum itself also, be intercepted within the hernia, and vitiated by an inflammation, and gangrene, as in the observation of Mery (i); it is evident that a discharge by stool is then prevented, and that the other circumstances happen, which are wont to happen in affections of the ileum of that kind: are wont, I say; for although these things happen to most patients in this case, there are some, in whom neither the bowels are quite lock'd up, nor are there vomitings of the excrements, or matter similar thereto, as, for instance, in those whom the celebrated men Wolf (k), and Cohausen (l), have describ'd; so that there is less reason to be surpriz'd, that it did not happen

(g) Mem. de l'a. 1700.

(b) Due Relaz. chirurg.

(i) Cit. *supra* ad n. 16.

(k) Act. n. c. tom. 4. obs. 68.

(l) Commerc. litter. a. 1742. hebdom. 26. n. II. ad. 3.

otherwise, to those whose diseases and dissections are related by the celebrated Storch (*m*), and Bajerus (*n*), whereas a part of the colon was intercepted in the hernia, and not of the ileum, which however was, universally, together with a large tract of the ileum, affected with that inflammation, from which the colon was free.

20. Having thus produc'd, and pointed out, the observations in which the pains of the intestines arose from a cause that fell under the notice of the eye, I go on to those in which the cause lay entirely hid within the body. And I will begin with those, that, by reason of the vomiting, and inflammation, come nearer to these which I have already describ'd. The two first are from the papers of Valsalva.

21. A slender man, of fifty years of age, began, after many fatigues in hunting, to complain of a great heat at his throat and chest. This heat, deserting those parts, discover'd itself in the loins, and in the belly, in like manner, where being join'd with a punctorious pain, it so troubled the patient, that he could not bear the parts to be touch'd. On the first days the man was frequently seiz'd with a cold rigor. But five or six days before death, a volvulus came on, with a throwing up of the fæces by vomiting: and this, by gradually wearing out the strength of the patient, brought him to the final close of life, about the thirtieth day after being confin'd to his bed.

The belly was found to be universally fill'd with sanies, which had connected the omentum, and the intestines, to each other. The left kidney contain'd extravasated blood, under the internal membrane, but not in every part. In the omentum, and on the edge of the mesentery, particularly where it was connected with the colon, were observ'd many small abscesses and ulcers.

22. When the abscesses first began to be form'd, not only the belly was affected with disagreeable symptoms, but the loins also, to which the mesentery is connected. The time of their coming to suppuration is pointed out by those frequent cold rigors. And the sanies being extravasated, left ulcers in these parts, and filled the abdominal cavity. Which there growing more and more acrid, by stagnation, irritated the coats of the viscera, and of the intestines in particular; and by this means an inflammation of all the viscera was brought on, and the motion of the intestines besides was inverted. Hence the volvulus.

You may compare this observation with those of the celebrated Mauchart (*o*), and Verdriesius (*p*), not on account of the volvulus, which seems to be but just hinted at in one, but by reason of the pains of the belly, especially as in both of them were abscesses of the mesentery, in like manner, in one open, so that the belly was fill'd with sanies, in the other not open'd, and the intestines which were, here and there, infected with a sphacelus, coher'd closely one with another, and with the omentum.

23. Another man, of the same age with the former, and of the same habit of body, but of a pallid colour, having been seiz'd, two years before, with an ardent fever, was at length freed from it without any perceptible traces.

(*m*) Aët. cit. t. 7. obs. 101.

(*n*) Com. cit. a. 1745. hebd. 40. n. 2.

(*o*) Eph. n. c. cent. 1. obs. 14.

(*p*) Aët. cit. tom. 1. obs. 87.

of a crisis; and was afterwards affected with a great thirst, a very great weakness of the head, and stomach, and a defect of the strength. Being every day troubled with these symptoms, he was seiz'd with a great oppression of the heart, which, in the night when he was about to fall into a sleep, was succeeded by a tremor of the whole body. He was thought, by other physicians, to labour under a consumption, but by Valsalva, to have a redundancy of water in the cranium, who also prescrib'd such remedies as are generally made use of in hydropic cases. But the patient, in the mean while, drinking a great quantity of new wine, with his bottle companions, was seiz'd with a great pain in his belly, which was unfix'd however, but join'd with status, with a vomiting of bilious matter, and with a celerity of the pulse. The next day in the morning, as the pain was not only more violent, but fix'd in a certain part, which was exceedingly painful when touch'd, Valsalva, fearing inflammation, order'd a vein to be open'd. Yet all remedies were to no purpose, and the patient died in the beginning of the fourth day.

In the belly every thing was found to be in a sound state, except the intestinum ileum, which was, in a great part of it, inflam'd.

In the thorax was nothing particular to be observ'd, except a very large polypous concretion in the right ventricle of the heart, which was produc'd from thence into the vena cava. Within the cranium was found a great quantity of serum, with which the ventricles of the brain were also fill'd. The glandules of the plexus choroides were very large, and abounded with a great quantity of serum: and the compages of the brain was lax.

24. How dangerous it is for considerable fevers to be solv'd without any crisis, is confirm'd by the first part of this history. And how just both the opinions of Valsalva were, is demonstrated by the appearances found in the head and in the belly. But as to there being only a vomiting in this patient, and not a volvulus, as in the former, you will not inquire into the causes thereof, when you have compar'd the dissection of this body with that of the former, or of the following: which, if I remember rightly, was made by me, in the hospital of incurables at Bologna, in the year 1705.

25. An old man of seventy four years of age, of a slender habit, and given to wine, had begun, for a month past, to walk in such a manner, as to bear chiefly on his left leg. Which his domestics had observ'd more than himself, at least he said nothing of it, nor complain'd of pain in any part. Two and twenty days after he was seiz'd with a wandring pain in his belly, join'd with no fever, which he, without consulting any one, expell'd by taking theriaca. But after twelve days had pass'd over, he was seiz'd, about noon, with a pain in the upper part of the iliac region, on the right side, which was very oppressive, and as he himself said, like that which would be caus'd by the gnawing of dogs. The pain'd part was swollen, but had not chang'd its colour, and if you touch'd it was soft: but pressing your hand down pretty low, you perceiv'd a hardness. The pulse, though in other respects good, was quick and frequent. His eyes were sunk into their orbits. His tongue was dry. He pass'd a bad night.

On the second day of the disease his pulse was very large, and vibrating. The pain and the tumour extended themselves to the middle of the belly,

and at length were continued towards the left side. Blood being taken away from his right arm, to the quantity of seven ounces, had no serum in it; but had a yellow and thick crust. He had a nausea to a considerable degree, but not so as to cause his food to be thrown up from his stomach. He went to stool freely and without any uneasiness. The second night was extremely bad.

On the third day his pulse was low: he had frequent eructations, which were bitter, and acid: his speech was vitiated as if by a convulsion: he was delirious at times, as was demonstrated by the childish, and trifling things, which the patient related.

On the fourth day his limbs were every now and then convuls'd, and the whole body remain'd rigid for a quarter of an hour: during this convulsion and rigidity there was no pulse: and, on the contrary, when the convulsion and rigidity were gone off, the pulse also return'd, and was much like that of a healthy person, except that it was low, and when press'd upon by the fingers gave no resistance. Respiration becoming very difficult after that, although the tongue was now moist, and the patient was no more delirious, he threw up the fæces by vomiting, and a little after, which was in the evening of the same day, he died convuls'd.

The abdomen being open'd, the left lobe of the liver was found to be lax, and universally affected with a sphacelus. The stomach and the intestines, especially the small intestines, were in some places red, in some livid, and in others black. But the beginning of the colon, where it lay contiguous to the muscles, which cover the hollow surface of the os ilium, together with these muscles, was universally affected with a gangrene, and so connected to them that it could not be separated without laceration. From thence the livid serum, mix'd with pus, which had been seen in the cavity of the belly, seem'd to have been extravasated, as a matter similar to it was contain'd in the intestines.

26. As to the beginning of this history, it is not very absurd to suppose, that some disorder had been, gradually, generated in those muscles, which I just now spoke of, from whence the neighbouring crural nerves were compress'd, and to suppose it to have happen'd from hence, that the patient, when he walk'd, bore chiefly upon his left leg. As to the disorder itself, inflammation and putrefaction afterwards coming on, the deprav'd and corrupted juices so vellicated those nerves, as to cause a convulsion of the whole body. And it is probable, that in a boy who was carried off by the iliac passion, the convulsions of the whole body are not to be ascrib'd to any other cause, than to that of a putrid matter flowing from the intestines, with which the same muscles were bedew'd: for these convulsions affected the lower limbs in particular, and were, as you read in this fourteenth section of the *Sepulchretum* (q), so obstinate, that the boy at length died convuls'd.

But in what manner the inflammation, in this old man, crept into the contiguous intestine, and other circumstances that I have describ'd, there is no occasion to explain. I go on therefore, to an observation, which that part of the colon, being inflam'd, recalls to my mind, and which was com-

municated to me, two years before I made the preceding, by that very learned and humane man M. Anthony Laurentio, who is, at present, one of the pontifical archiaters.

27. A woman, who had had a fall on her back a year before, having been lately afflicted, for some days, with a very great, deep seated, and excruciating pain in her belly, join'd with vomitings, was taken off thereby.

Her stomach was found to be surprizingly contracted, and the cæcum intestine of the ancients so dilated, by yellow, and semifluid fæces, that it resembled the stomach. This intestine had been seiz'd by an inflammation, which also began to diffuse itself through the neighbouring viscera.

28. If that fall had any reference to the causes, which gave rise to this disease of the woman, it is to be suppos'd that she had fall'n upon her back in such a manner, as to hurt the right side of her belly and that part of the colon which lay in this side. And that this part of the intestine having, for that reason, the power, by which it propels the fæces upwards, more and more diminish'd every day, was, at length, expanded by the stagnation of its contents, in the manner I have describ'd, particularly with the cæcum that was subjoin'd to it, and that, on account of the distraction of its coats, it was affected with a very severe pain, and by reason of the compression of the vessels inflam'd. And if the woman had dragg'd on her life a little longer, perhaps she, also, would, like some of those of whom I have already spoken above, have vomited up excrements in a filthy and miserable manner, or rather somewhat extremely like excrement. For many being deceiv'd by this similitarity, have suppos'd that what had already pass'd into the large intestines, was thrown up by vomiting in a volvulus, which must happen much more rarely than they imagine, by reason of the valvula Bauhini being interpos'd, and this is also shown by other circumstances, which are taken notice of by me in the *Adversaria* (r).

That they have really been deceiv'd by this similitude, it is not difficult to demonstrate, by producing many observations of vomitings of that kind, even in those bodies, wherein the passage from the large intestines to the mouth was entirely shut up. For, to omit others, where this passage was intercepted by a very closely confin'd hernia, or by an obstruction, or coalition, of the tube, turn, by way of example, to that observation of Henricus ab Heers in the *Sepulchretum* (s). A mountebank had tied up the intestine ileum of a boy, who had a rupture, together with the omentum, with a piece of iron wire, so that nothing at all could pass through. And the boy died, as the observation says, "throwing up his excrements by his mouth." Add to this, the several experiments of the celebrated Hague-not (t), upon cats and dogs: which vomited up excrements, to appearance, though a firm ligature was put upon the same intestine. Who would not, at first, have imagin'd, that these fæces were carried back from the large intestines, if he had not known that the small intestines were quite shut up.

For without doubt, those ingesta which are carried down from the stomach to the intestines, being mix'd with the juices of the stomach, and soon

(r) III animad. 9.

(s) Qbf. 24. §. 3.

(t) Mem. de l'acad. r. des sc. a. 1713.

after with the juices of the intestines, with the succus pancreaticus, and the bile, and having had many of their finer parts carried off into the lacteal vessels, are under a necessity of making that delay in the small intestines, when their passage is obstructed, which they naturally would have made in the large, and even a greater delay when these small intestines are inflam'd; so that they will of course contract the same putrefying odour in the small intestines, that they us'd to contract in the large, and may be call'd excrement without any impropriety, as is asserted by Picothomaeus (a), who, for this reason, denies that it is necessary for the remains of the ingesta, after the chyle is taken up, to reach the large intestines, in order to acquire the nature of excrement. But although they are not deceiv'd in this, they are, nevertheless, from hence carried into an error, when they suppose this faecal matter to come from the large intestines, which comes in fact from the small.

19. But that the faeces may be carried back quite from the large intestines, is demonstrat'd by suppositories and glysters being thrown up by the mouth, in patients who labour under the iliac passion. I seem however to have said, sufficiently, what I think of suppositories, and of glysters likewise, in the *Adversaria* (x). But as I have since read, in the writings of a considerable author, that this happens "frequently," and in those of another, have seen this circumstance explain'd, without supposing an inverted motion of the intestines, in a method entirely new, I have determin'd to add some few things, in this place, upon both of these heads. And in regard to the first, Galen has not only taught us, in more than one part of his works (y), that the motion of the intestines is inverted, in an iliac passion, and even without it, but also in the third book *de sympt. causis* (z), has asserted once and again, "that some persons have had part of the glysters, that have been injected, carried into the stomach, so as to be thrown up by vomiting: and besides, that excrement was frequently thrown up, in iliac passions, that prove mortal."

But from his time, quite down to the time of Jo. Mathæus de Grado (a), that is from the second age of the christian æra, to the sixteenth, I do not remember to have read any one who confirms it. After him, and in the sixteenth century, was one, that is Julius Alexandrinus (b), who says that he had seen it, "not very often, but sometimes," as Franciscus Hildegius has said he did twice (c). But in the last age, and in this, a great number indeed have asserted it. For you may read three observations of Abel Rescius (d), of Daniel Sennertus (e), as it appears to be, of John Henry Lavaterus (f), of Luke Schroockius the elder (g), and of John Mery (h), each one, and many from the compilers of the *Bibliotheca Anatomica* (i): and besides,

(a) L. 2. tract. præfati. 11.

(x) *Animad. cit.*

(y) *De nat. facul. l. 3. c. 13. & in Hipp. de vict. in acut. comm. 3. c. 33.*

(z) *C. 2.*

(a) Apud donau. de hist. mirab. l. 2. c. 3.

(b) Apud Sennertum. *obs. med. l. 3. sect. cit. mirab. rer. woman.*

(c) *Idem.*

(d) Apud Hildegium. *com. 6. obs. 70.*

(e) *In hac 14. septemb. fest. febr. ad obs. 20.*

(f) *Theat. 6. cit. supra ad n. 16.*

(g) *Eph. n. c. dec. 2. a. 5. febr. ad obs. 196.*

(h) *Obs. 2. cit. supra ad n. 16.*

(i) *Tom. 1. p. 2. in annot. ad Peyer. exercit. 1. de gland. intest.*

without:

without the iliac or colic passion, one of Peter Borelli (*k*), another of Frederic Loffius (*l*), a third of George Segerus (*m*), a fourth of Gabriel Cluzderus (*n*), and a fifth, in fine, of Peter Rommelius (*o*); for so many are there, that I at present call to mind. You yourself will easily find others. But if you should even find as many as these, you would, I suppose, say that the throwing up of glysters by the mouth, was not a very rare thing, but would not say that it is frequent. For the greater part of physicians have never seen it, even those that are the most experienc'd; as their writings testify, where they happen to make mention of these observations, for in order to prove the circumstance, they produce the testimony of others, instead of their own.

30. But let us now see by what new method the throwing up of glysters by the mouth is explain'd. It is suppos'd that in a volvulus, all the intestines are full, or nearly full, of fluids that are either continually flowing into them, or taken in by the patients: and that there is some obstacle or other in the lower part of the rectum, which hinders the discharge of these fluids, but which may be got over by those who inject glysters. The glysters, then, that are thus injected, increasing the fullness, and distention, of the intestines, and an alternate compression of the abdominal muscles, and diaphragm, coming on, it is suppos'd that they are driven to the part where there is the least resistance, and that, being mix'd with these humours, they are at length thrown up by vomiting. And that the valvula Bauhini does not resist, as it will be naturally kept open, if you allow a fullness of all the intestines. Nor is there any need of the inverted motion, especially as in beasts, who were already seiz'd with a vomiting, on account of a ligature being made upon the ileum, this motion could not be observ'd, and even not the peristaltic motion, which seems no longer to be fully acknowledg'd, in living and healthy bodies, if you attend to those things which are in the latter part of this explication.

When I first read all these things, although there were some which I found could not be easily prov'd, yet I began to do, what ought never to be omitted in the investigation of truth, that is to attend not only to the arguments which might be produc'd against this explication, but also to those that might be produc'd in favour of it. In consequence whereof I observ'd, that some of those suppositions, which the ingenious author had condemn'd, not only by his own reasonings, but by his own experiments, were also equally prov'd by mine. For as to what relates to the plenitude of the intestines, from the obstacle quite to the stomach, this has been found in the manner he supposes, by my observations also upon human bodies (which he complains of being without) that had been afflicted with disorders of this kind; as the histories of the husbandman (*p*), the porter (*q*), and in great measure that of a certain woman (*r*), which I have given you, demonstrate. And supposing the fullness not only of the small, but of the large intestines, I saw that the

(*k*) Cent. 1. obs. 17.

(*l*) Vid. schol. modo cit. in eph. n. c.

(*m*) Earsud. dec. 1. a. g. obs. 94.

(*n*) Earsud. dec. 2. obs. cit.

(*o*) Earsud. dec. 3. a. 7. obs. 32.

(*p*) Supra a. 9.

(*q*) N. 18.

(*r*) N. 11.

"impediment, which I had, in a general way, hinted the necessity of inquiring into, in the *Adversaria* (s), appear'd, by means of which impediment, being interpos'd for a time," the *valvula Bauhini* "could not be properly shut up;" I say for a time; for if it be suppos'd perpetual, it will not be understood, by what means this valve may have immediately return'd to its office, after having suffer'd glysters to pass through it, as has been seen in some of these cases which were pointed out just now (t).

For in these cases, the explication of those who have conjectur'd that the valve is either ruptur'd, or become paralytic, in patients afflicted with the ileos, would not be sufficient. As this last conjecture, I suppose, cannot take place, even when the beginning of the colon is suppos'd to be immoderately dilated, with a great quantity of matter, which is collected together. For although the valve, by reason of the fleshy fibres of the two intestines whereof it is compos'd being become paralytic, should lose that power of constringing itself, whatever that power might be; yet the two *fræna*, or bridles, which I have added, are so dispos'd transversely, on one side, and on the other, through the internal surface of the colon (u), that by a surprizing utility, the more this intestine is dilated, the more do they constringe the chink, or aperture, of the valve, which use I believe it very often performs in life, when, perhaps, there is a great quantity of matter contain'd in that part of the colon, and the muscles of the abdomen are in strong action to compress and propel it: and as I do not doubt, but that these things, in regard to the structure of this valve, and its *fræna*, which I have describ'd in words, and represented in plates, in the *Adversaria*, are admitted by you; so I could wish that these things, and some others, which relate to me, had been consider'd a little more attentively by some persons: but of these things on another occasion.

Finally, to omit other things, as to that action being attributed to the muscles of the abdomen, and the diaphragm, which is generally attributed to the inverted motion of the intestines, that this is not done without reason, may be prov'd by those cases, in which the ileos has happen'd on account of the expulsive faculty being abolish'd, or from a loss of tone in the intestines, as has been hinted at above (x), according to the opinion of Salius, and Ruysch. In which place the authority of Boerhaave (y) may also be produc'd, who asserts "that in the numerous dissections of living animals, he had never seen a peristaltic motion in the large intestines," and he wonder'd, for this reason, "that glysters should nevertheless be thrown up, from the large intestines," by the mouth; for he did not doubt but this did happen "sometimes, as men of learning and authority bore their testimonies to it."

31. But notwithstanding I had observ'd these things to be favourable to the propos'd explication, other things arose, by way of objection to it, which very evidently argued against it. And not to take up too much of your time, this in the first place, that if all the intestines are suppos'd to be full, or

(t) III animad. 9.

(s) N. 29.

(u) *Advers.* 3. fig. 1.

(x) N. 12.

(y) *Prælect. ad instit.* §. 816 in fin.

nearly full, it is not possible to conceive how the glysters can be thrown up by vomiting, mix'd, as is said, with other fluids, but quite pure, as they were given, and that not very long after their injection, and without any great discharge of those humours, with which the whole canal, from the rectum to the stomach, is fill'd, or almost fill'd, having preceded.

For read the observations of Roscius, of Schrockius the elder, and of the compilers of the *Bibliotheca Anatomica*, which were made upon volvulus patients, and which I have pointed out above (z): read also those that I have taken notice of from Loffius, Segerus, Clauderus, and Rommelius (a), where there was even no volvulus, so that very strong compressions of the muscles could be suppos'd; nor was there any obstacle, except a slight costiveness in one or two, which could have confin'd the humours in almost the whole tube of the intestines. You will find among the several observations, that the glysters were thrown up by the mouth, "wholly, entirely," and these "pure as they had been applied, nothing at all chang'd," after they had been "retain'd in the intestines for an hour, after about the space of an hour, after a quarter of an hour, when a quarter of an hour had scarcely elaps'd, in a moment of time," without any vomiting being any where taken notice of, betwixt the times of injecting the glyster, and throwing it up by the mouth, not to say without so considerable a vomiting as you perceive there must have been, had the intestines been all full.

Since, therefore, the intestinal tube, in these cases, was neither full, nor nearly so, it appears, without doubt, that another explication must be sought after, from which it may be clear, not only what cause could propel the glysters, from the rectum to the stomach, but also, by what means the valvula Bauhini could be kept open. And we must take care, now in particular, when there are many who call into question, the powers of the diaphragm, and abdominal muscles, to excite vomiting; we must take care, I say, left, as to what relates to the first cause, that be too hastily rejected, which even from ancient times was plac'd in the inverted motion of the intestines. For although this motion was certainly not readily to be allow'd of, where the intestines were tied, distended, inflam'd, or paralytic, why is it to be denied where there is none of these circumstances? And there could be none of these circumstances, in those observations which were taken when no volvulus was present, nor was it necessary even when this was present, or at least it was not always necessary, that it should be in a great part of the intestines, and especially in that which I particularly refer to here, that is in the large intestines.

Why, therefore, must we altogether, and at all times, reject this cause, and suffer it to have no part in the performance? Is it because the peristaltic motion is perhaps scarcely to be acknowledged any longer? How is it then? Is it possible for the nature of animals to be so chang'd, that in our age the circumstance scarcely appears any more, which those very ancient observers have seen, in consequence of whose opinion Cicero has expressly written (b), "that the intestines both constrict and relax themselves alternately," either to agitate and prepare the food, or to drive the remains of

(z) N. 29.

(a) Ibid.

(b) L. 2. de nat. deor.

it, after concoction, downwards? But lest it should happen to any one of those whom I have refer'd to, in the preface to the second *Adversaria*, near the latter end, that this passage of Cicero, also, may seem "to be quoted" by me, "by way of pretty severe reproach," I choose rather to neglect what might be replied on this occasion, and to come down from the ancients, to the more modern observers. Shall I then forget the great number of observations, not only of others, but of my own also, on dogs, sheep, and rabbits, dissected alive, though this motion often occurs to the eyes of those persons who do not look for it, and even, as happen'd in a rabbit particularly, a motion alternately antiperistaltic. But it is very little to the purpose, now, to show that one of these motions has been observ'd in human bodies also, and sometimes both, since the celebrated Haller (*c*) has produc'd examples thereof: to which, however, if you please, you may add that of a matron, who had a very considerable omphalocele, or umbilical hernia, which was seen by the compilers of the *Bibliotheca Anatomica* (*d*). And the same Haller (*e*), even before he publish'd so many experiments (*f*), caution'd us from believing that because it had happen'd to his great preceptor, that he never, as I have said, saw a peristaltic motion in the large intestines, it had therefore never been seen by any one; for he quoted Wepfer, in particular, who saw it very evidently in these intestines likewise, and not only the peristaltic, but also the antiperistaltic, as you will learn from the passage of Wepfer, which is, in like manner, transfer'd into the *Sepulchretum* (*g*).

32. From these things, which I have consider'd on both sides of the question, you will easily perceive, that any probable cause, which tends to explain the symptoms that happen in the *volvulus*, particularly those that are difficult, and not as yet sufficiently clear, ought not to be entirely rejected.

But as to the causes which create an obstacle to the matter, that descends through the intestines, if you inquire of me, whether I ever found that contorsion, or twisting, which was formerly so much talk'd of, or at least an *intus-fusception*, as it is call'd, which is even very frequently confirm'd by the more modern authors; I shall ingenuously answer, that I have as yet lit on neither of them, just in this manner, as I shall explain hereafter (*). Yet I do not, for this reason, in regard to the first cause, suspect any of the obstacles of this kind that are describ'd, but only because, while the connection of the intestines with the mesentery is preserv'd, this contorsion cannot be conceiv'd.

But the second, or the *fusception* of the intestine within the intestine, is not only conceivable, while the connection with the mesentery is preserv'd, but is also very injurious, on account of this very connection. For when one part of the intestine enters within the part next to it, the portion of the mesentery, that is annex'd thereto, must enter in at the same time. Wherefore, if it stay there for any considerable time, and any constringing cause come on, the motion of the blood, through its vessels, being retarded, it will swell to,

(c) *Ad Boer. prælect.* §. 93. n. 6.

(d) *Tom. 1. p. 1. adnot. penult. ad Warth. de mesent.*

(e) *Ad cit. prælect.* §. 107. not. 3. & §. 109. not. 30.

(f) *De respir.* p. 3.

(g) *Schol. ad. §. 2. obs. 1. hujus sect.*

(*) *N. 34.*

such a degree, as to hinder the intestine that has enter'd in, from receding, and likewise prevent the passage of the matter that was about to descend through the cavity; to say nothing of the sphacelus that at length comes on, on account of the circulation of the blood being entirely precluded, which, as the illustrious Haller saw (*b*), was the cause of death in a certain man. And every part is so much the more constring'd and compress'd in that place, in proportion as the part of the intestine which is push'd within the part nearest to it is larger or more complicated; for this complication has been sometimes so great, that a portion of the intestine, which while thus conglomerated together did not exceed half an inch in length, was equal almost to two spans when drawn out (*i*). And so much the greater extent enters in, in proportion as the causes are greater, or more long-continu'd, which impel the part that enters, and dilate the part which receives.

Among the latter causes, for the most part, is flatus, and among the former, sometimes, is weight, as in the observation of the same compilers of the Bibliotheca Anatomica (*k*), whom I have once and again quoted, which is an extraordinary observation, not on that account only, but also because the susception had happen'd in the colon, in which I read that very few had ever seen it besides Ruyfch, who confesses (*l*) that he had seen it only once, whereas he had seen it so often in the small intestines, that no body more frequently. However, no cause is suppos'd to be more common than convulsive motions: which the experiment of Peyerus, wherein the intestines of a living frog were stimulated, in more places than one, shows to be capable of producing this effect: this experiment you will read in the Sepulchretum (*m*). And the same thing seems to me to be confirm'd, by the observations of Peyerus himself (*n*), but in particular by those of Ruyfch (*o*). For the former saw in the intestinum ileum of a girl, in which were three susceptions, worms "roll'd up together, as it were, in one place;" and Ruyfch saw the very portion of the ileum, which had enter'd into another, in a man, "fill'd with worms circularly plac'd," and a second time he shew'd a susception of the same intestine, "in a boy, to have worms in it." And it is very evident that the intestines may be very much irritated from worms.

Indeed that eminent physician Heister (*p*), having found a double susception, in the small intestines of a boy of twelve years of age, and having observ'd the same intestines to be "very full of worms," thought it "worthy to be observ'd in the practice of medicine, especially if they are very young subjects, which fall under our care," that the iliac passion may sometimes arise from worms also. And for this reason, perhaps, it has been, that I have seen the greater part of the susceptions remark'd in children. While I attend pretty diligently to some of those things, which I have hitherto taken notice of, I cannot help adding my own observation in this place, in reading of which, if you begin to wonder that I had just now denied my ever having seen a susception of the intestine, you will, at least, cease to wonder, when you have consider'd those things which I shall subjoin to the observation.

(*b*) Strena anat. n. 9.

(*i*) Vid. Sepulchr. §. 2. modo cit.

(*k*) Adnot. cit. supra ad n. 29.

(*l*) Advers. anat. dec. 3. §.

(*m*) Schol. ad § 8. obs. 20.

(*n*) §. modo cit.

(*o*) Thef. anat. 4. n. 14. & Thef. nov. n. 57.

(*p*) Eph. n. c. cent. 1 & 2. obs. 198. n. 3.

33. A virgin of forty-five years of age, having received a violent blow on her head from a fall, not only vomited in the beginning, but continually; she liv'd in this hospital more than twenty-one days, in which time, however, she seem'd frequently upon the point of expiring.

In the abdomen; for I only inspected the viscera of this cavity, and that not with a view to the disease; the intestines were still warm, although it was many hours after death, that I handled them, and at least one hour from the time of cutting into, and laying open the abdominal cavity, as I was engag'd about some other business in the mean time, and although it was at a time of the year which is generally cold, that is about the middle of December, in the year 1724, when the season was extremely cold. Part of the small intestines was distended with flatus, especially that part which lay under the cæcum, for which reason this intestine, with its appendicula, was turn'd forwards: the remaining part was reddish, and had a kind of putrid smell. In this part I saw the susception, of which I am speaking, not less evident, and even somewhat longer, than it is delineated by Ruytch (q).

But while I was desirous to learn very distinctly, in what part of the intestines it was, and how close it was, and for that reason turn'd over the intestines gently, as one generally does, in order to begin from the other head of the small intestines, I found out this head very clearly, but the susception I could no more find. For all the small intestines being examin'd accurately, from one extremity to the other, and back again, and run over with the hand, this susception no where appear'd, and indeed not a trace of it, so that it was very plain it had not been closely constricted. Then opening the small intestines, which was all that remain'd to do, I saw, in the duodenum, a matter like fluid feces, in the neighbouring tract of the jejunum, a round worm, and in the same tract, and the neighbouring part of the duodenum, I saw, here and there, bloody spots, with which both of them were distinguish'd internally, as if from inflammation, which had begun to be the consequence of the irritation. And in the remaining intestines, and the abdominal viscera, I also observ'd, and demonstrated, many things, but not such as had reference to the disease, if you except some that were remark'd in the organs of generation, and in the bladder, or rather in the urethra. For the uterus being laid open with the knife longitudinally, from the sanguiferous vessels, which appear'd to be parallel throughout the internal surface, some black corpuscles, as it were, seem'd to be prominent, here and there, so that I at first took them for very small varices. But when I examin'd them in the morning, by the light of the sun, I found that they were not varices, and indeed I much doubted whether they were really in these vessels. For I saw that two larger bodies, which lay in the common boundaries of the bladder, and urethra, were peculiar substances, brown in their colour, and roundish in their figure, and when I touch'd them, I perceiv'd them to be hard; so that I believ'd them to be calculi *sui generis*, which had been concreted under that internal coat, and rais'd it up; and that the others, as they were less in size, were also less hard, and not roundish, yet were made of a matter of the same kind, and in the same manner, but were not yet perfectly form'd.

As I had observ'd this kind of disorder which is perhaps new, and which, in procefs of time, would, probably, have made the urethra very narrow, and was certainly injurious even now; I dissected the uterus, to see if I could find the original springs of that whitish, and thickish humour, with which I saw that the vagina was too much moisten'd. But I saw nothing that was not usual, in this cavity, except a small heap of little vesicles, which was prominent in such a manner, that the area thereof did not exceed the circumference of the nail of the little finger. This was on the anterior surface of the cavity of the uterus itself, on the right side, and nearer to the upper part of the same cavity, than to the cervix uteri; so that, at first, I suspected it to be the beginning of the excrescence, of the same kind with that which you have read my description of, in the cavity of the uterus, frequently, upon other occasions. And this suspicion was confirm'd by the prominence: but the nature of the vesicles, which cover'd the face of the prominence, did not agree therewith; for they themselves, and the mucus they contain'd, were entirely of the same kind, and had the same natural appearance, with those that were below in the neck, in greater number, which I have formerly pretty well describ'd, and represented by figures (*r*); not hydatids, which were not wanting here, also, at the tubes, and near the ovaries, white, hard, and stringy.

But vesicles containing a limpid mucus, which could be drawn out into threads, plac'd in so high a situation, as in this virgin, and there collected into a heap, I do not remember to have seen, except very seldom. For if they had always appear'd in this manner, one of the great difficulties, in the opinion of Nabothus, would be remov'd.

34. But of this on another occasion. Now let us return to the intended discourse. You see that in this virgin, a part of the intestine had fallen into the part which was nearest to it: that on one side there was flatus to dilate; and on the other a worm, which, by stimulating, might contract the intestine, and excite inflammation: that an obstinate vomiting was not wanting, nor yet in the duodenum, a matter like liquid fæces. All these circumstances concurr'd to prevent me from omitting this history here. But the very violent blow of the head, which of itself generally excites a vomiting, the very slight inflammation in the small intestine, which seem'd to be but lately begun, and which, perhaps, is to be accounted for as is hinted in the nineteenth letter (*s*), but, in particular, this suscepcion, which was so very lax that it easily became evanid, without leaving any traces behind it, have influenc'd me not to consider it as the cause of these vomitings, nor yet to number it among those causes of which I am at present treating. For I do not here refer to those which are frequently found, and are easily develop'd, such as I suppose those three to have been, that Abraham Vater (*t*) saw in the intestinum jejunum of a girl, without any signs of a volvulus; and such as they probably were, that are describ'd in the same intestine of three bodies, in the observation of the celebrated Hommelius (*u*), wherein no mention is made of any of these symptoms; and, not to be too prolix, such as they were, without doubt, that

(*r*) Advers. anat. 1. n. 32. & tab. 3.

(*s*) N. 18.

(*t*) Progr. edito a. 1727. m. April.

(*u*) Commerc. litter. a. 1743. hebdom. 42. in fin.

are describ'd by the celebrated Haller, not in the *Strena Anatomica*, from which I quoted one above (x), but in the *Opuscula Anatomica* (y), for these were many in number, and had various situations, so that one of them was from the lower part of the colon, in the upper part of the intestinum rectum.

And some are even met with that are not so easy of evolution, as that which was found by the celebrated Jo. Phil. Burgravius (z), "in a pretty " confin'd state," yet without any sign of the iliac passion being join'd with it: was it because no inflammation had come on? Though indeed an inflammation had not succeeded to the other, which was seen by the same person (a), yet there had been some tormina at least, and a vomiting of the remedies which were taken in: did these symptoms arise from the intestine having been push'd within itself, to twice the depth of the other, in this second case?

But Hartmann (b) found an intus-fusception of the intestine to a considerable depth, and that in three places, nor equally easy of evolution in them all; and he even found the intestine to be there "somewhat turgid externally, " and bloody, an evident mark of the tumor remaining even in a portion " that was cut off;" nor was a very long worm wanting in the small intestines of the same body: yet he mentions no symptoms of a volvulus; but even remarks, "that the intestines had perform'd their functions very well, " doubtless, because the passage was not entirely obstructed by these fusceptions." And Jo. Guil. Wiemann (c) found also a much longer portion of the intestinum jejunum, that is more than a geometrical foot, fallen within the part next to it, "much streighten'd and compress'd, and infected with a " livid colour," and this after pains which had been indeed very severe, and almost continual vomitings, yet not of matter like fæces, nor attended, as he says, with a suppression of stools, which was probably because the inverted portion, although narrow, was found to be still "pervious."

Wherefore, I should readily believe, that these two fusceptions were still more pervious, and not only shorter and less compress'd, which that celebrated man Jo. Rod. Zuingerus (d) found in the intestinum ileum, together with an incipient gangrene, who certainly would not have omitted to mention some marks of an iliac passion, if any had preceded: but on the other hand, I should suppose those two were less pervious, which Valentinus (e) found in the same place, as he relates the same symptoms as Wiemann, and does not doubt but a vomiting of excrement would have come on, if the boy had liv'd some time longer: which you will find did come on, in another describ'd by Hoffmann (f); the fusception, which was in the same intestine, serving at once to prevent the passage of the flatus, with which the upper intestines were distended, and that of a putrid humour which was seen in the stomach, of the same colour with that which had been thrown up by vomiting.

(x) N. 32.

(y) Obl. 27.

(z) Ag. n. c. tom. 7. obf. 5.

(a) Earund. t. 5. obf. 80.

(b) Eph. n. c. dec. 3. a. 5 & 6. obf. 207.

(c) Earund. cent. 6. obf. 89.

(d) Earund. cent. 7. obf. 83.

(e) Earund. cent. 3. obf. 1.

(f) Med. rat. t. 4. p. 2. f. 2. c. 4. obf. 4.

To these you will add, in particular, the observation of the celebrated Weiffius (*g*), who in the body of a woman, that died after having been afflicted with violent pains of the belly, join'd with an obstinate obstruction of the intestines, and at length with a volvulus, found the extremity of the ileum fallen within the colon, concreted with the membranes of it, and contracted so as to prevent the progress "of a foetid liquor, almost of the nature of excrement," with which the small intestines were seen to be "surprisingly distended," being attended with inflammation at the same time.

Nor, finally, is that observation to be omitted, though made upon a dog, which the celebrated Wahrendorff (*b*) has given us. This creature having had no discharge by stool for some weeks, had vomited up every thing he took with miserable howlings; and having at length died, discover'd no inflammation, or obstruction, in the intestines, except that "about the beginning of the intestinum rectum, there appear'd an intus-fusception, to about the length of two inches, which shut up the passage so completely, that not even the least flatus could be transmitted." From all these observations which I, according to custom, have taken notice of, in order that you might have some to add to the Sepulchretum, you easily perceive, that an obstruction of the intestinal canal, or a considerable and long-continu'd coarctation, has more effect towards producing a volvulus, than an inflammation; and that therefore an intus-fusception which does not cause an obstruction, or coarctation, as those that are slight, and easily moveable, by no means do, ought not to be attended to by us here.

To this class I refer those that I have hitherto happen'd to see, and readily acknowledge them to be of that kind, which an eminent author in anatomy and surgery, of the present age, has asserted to occur in many bodies, who died of a natural death, and who had been afflicted with no pain. But while he ascribes so much to the observations of this kind, as to suppose that the doctrine of others, who have plac'd intus-fusception of the intestines, among the causes of a volvulus, is a mere figment, I cannot coincide in opinion with him, unless I would run counter to so great a number of observations of other persons, that are contrary to his, and even run counter to reason itself.

For although I acknowledge, that it is not at all necessary any very violent disorder should arise, where there is a lax fusception, that does not streighten the passage greatly, yet on the other hand, I maintain, that if the fusception is not lax, and shuts up the passage for a long time together, or at least nearly shuts it up, a volvulus, or pains, inflammations, and other symptoms of this kind, are the consequences, as you see in the histories which are pointed out in this section of the Sepulchretum, under number twenty, and in others, but particularly in those of Ruyfch (*i*), and in some of those besides which are referr'd to here, or above (*k*).

35. However, it is evident that a volvulus may be brought on, not only by fusception, or by a hernia, or by an inflammation of the intestines, but also

(*g*) *Commerc. litter.* a. 1745. hebdom. 24. n. 1, ad 11.

(*b*) *Act. n. c. tom.* 3. obs. 132.

(*i*) *Obs. anat. chir.* 91. & *advers. anat.* dec. 3. 5. & *thes. anat.* 10. n. 62. & *alibi*.

(*k*) *N.* 32.

by other causes, which either obstruct, or stimulate them, as appears both from the observations of others, and from mine also, which I shall communicate to you on future occasions; and from causes that obstruct, necessarily, and unavoidably, provided life lasts for any considerable time with them; but from stimulating causes, sometimes only. And the obstructing causes often relate to the coats of some intestine, as, for instance, that scirrhus ring spoken of in the thirty-second letter (*l*); for stercoraceous vomitings were at length the consequences thereof: and, at other times, relate to the contents of the intestines, and not only to the harden'd excrements, as in the example related by Hoffmann (*m*), where, being collected together, to about the quantity of twenty pounds, they had so distended the colon of a certain prince, who was afflicted with the ileos, that they at length burst through it; but also, sometimes, to a calculous matter, which is gather'd about gall-stones, or about gold coins, that have been swallow'd, and which being so increas'd by their long continuance in the intestines, has brought on the same disorder, by shutting up the passage, and rendering it impervious: examples of which things, to pass over those of others, you will find in the books of the Cæsarean Academy (*n*).

Moreover you will in these same volumes, also, find instances which you may set down to the class of stimulating causes (*o*); as when a young man, by a fall upon his abdomen, ruptur'd the bladder, and caus'd the urine to be pour'd out into the cavity of the belly, so that the intestines being stimulated by an unusual acrimony, which the inflammation, and gangrene, that was the consequence of their inflammation, shew, inverted their peristaltic motion; or when the abdomen of a full-grown foetus being bruise'd by a like fall of its mother, was the reason that blood stagnating, and putrefying, in the vessels of the intestines, brought on equal effects therein, by irritation, for the infant discharg'd nothing at all from the rectum, but every thing, even the meconium itself, by the mouth, and died in a miserable manner within eight days from its birth. And if the stimulus excite convulsions, what they are capable of doing, not only by producing susceptions, as I have said above (*p*), but also without these by inverting the motion of the intestines, the experiments of Brunnerus (*q*) will show; I mean the grandson, who was worthy of his grandfire; by which it appears that convulsions being excited in the intestines of beasts, the excrements, which could not now be discharg'd through the anus, ascended into the stomach and œsophagus. And a disease which by reason of its very violent tormina, and continual vomiting, and by reason of the large intestines being unusually streighten'd, when the small intestines were very turgid, and red, and fill'd with a remarkable quantity of extravasated, and fluid blood, is very similar to the volvulus, has been accounted for by the celebrated Kulbelius (*r*), from spasmodic contractions. And whether it was from these spasmodic contractions returning now and then, or from the effect of them which remain'd, that the same intestines

(*l*) N. 5.

(*m*) C. 4. paulo ante cit. §. 13.

(*n*) Act. t. 7. obs. 100. & cent. 1 & 2. obs.

154.

(*o*) Cent. 7. obs. 30. & act. t. 3. obs. 131.

(*p*) N. 32.

(*q*) Experim. circa ligat. nerv. §. 31.

(*r*) Commenc. litter. a. 1737. hebdom. 20. n. 2.

had some parts which were unequal, and, at unequal intervals, præternaturally narrow, in that anatomist Jo. Wilhelmus Albrechtus, who, while he liv'd, was very often subject to the ileos, you yourself will judge (*s*).

36. But among the causes which sometimes bring on the iliac passion by stimulating, worms must of course be enumerated. For sometimes, as is hinted at above (*t*), by exciting convulsions, they cause intus-fusceptions, and volvulus: and it is not to be doubted but they can excite a volvulus, without causing fusceptions. At other times they create pains in the intestines only. And sometimes not even these. And it also frequently happens, that a great number of worms are found in those bodies, in which, while living, there had scarcely been the least symptom of worms: and this you will see sufficiently confirm'd, by reading over again the history of the country-woman describ'd in the sixteenth letter (*u*), or what I formerly wrote of the hound (*x*), in which there were tæniæ, to the number of sixty. And, on the other hand, there are sometimes symptoms of worms, and none are found, as you learn from the history of the boy given you from Valsalva's papers, in the thirty-first letter (*y*); and not to dwell too long upon an obvious thing, the same will appear from another also, that is related in the Sepulchretum (*z*).

But in regard to worms exciting pains of the belly, I shall perhaps have occasion to speak on this subject, at another time, and to enquire more at large, whether, as they irritate the intestines in the living body, it is likewise to be suppos'd in all the histories, which are produc'd to prove it, that they perforated the intestines before death, or rather that they perforated the intestines after death, and if they did really pervade the intestines before death, whether it was where an abscess, or some kind of ulcer, had open'd them a passage from the intestines. For many and various observations are produc'd: of which, however, it will be sufficient to point out some to you, of those that you may add to the Sepulchretum. See first two of these in the acts of the Cæsarean Academy (*a*). In one of which, in proportion as the intestines are said to be more fill'd with an incredible quantity of worms, from the upper to the lower part of that tube, it may perhaps seem to be render'd so much the more credible, that they, especially as they were instigated by a quantity of bitter elixir, had begun to perforate the intestines in the living body, from which they were already protruded by half their length. An equal, and even a greater, quantity of worms was found by our Molinetti (*b*); for besides those, with which all the intestines were fill'd, and stuff'd up, others had got out from the intestinal tube, which was perforated like a sieve, and fill'd the abdominal cavity all around. But these appearances were seen in the dead body, as those also which I found in a hen (*c*).

But how is it when they are seen in the living body? A very ancient observation is extant of Hippocrates (*d*), made upon a little child of Dinius, from whose navel, "a large worm sometimes" came out. But as a "fif-

(*s*) A. 1736. hebd. 12. n. 1.

(*t*) N. 32.

(*u*) N. 38.

(*x*) Epist. anat. 14. n. 48.

(*y*) N. 5.

(*z*) Obs. 1. §. 2.

(*a*) Tom. 1. obs. 172. & tom. 5. obs. 68. prope fin.

(*b*) Dissert. anat. Pathol. 1. 6. c. 4.

(*c*) Epist. anat. 14. n. 44.

(*d*) Epid. 1. 7. haud ita procul. a fine.

"tula" had been left there from a foregoing wound, and the worm and bilious fordes came through the same place; it was certain, beyond a doubt, that the small intestine was perforated; but it was from a wound; for that it was perforated by the worm, was not even suspected by the grave interpreter Vallesius (*e*). There is likewise extant; not to digress improperly from those observations which are join'd with the dissection of the body; there is extant, I say, in the acts just now quoted (*f*), an example of fifteen worms coming out from the right hypochondrium, and the loins, on the side that corresponded thereto, yet through tumours which had been form'd in both places, and suppurated; the origin of which is attributed to the worms, indeed, having gnaw'd the intestinum colon, but at the same time to a vitiated, corrupt, and eroding saburra, which had been collected there. When you read, therefore, in the first (*g*) and seventh (*h*) centuries of the same Cæsarean Academy, other observations of that kind; although in the second, for the sake of brevity, perhaps, no mention is made of any tumour, or abscess, you will consider what any one might suspect. For it is my intention here, as I have said, to point out the examples which relate to the various causes of pains in the intestines, and not to enquire how, and in what manner, they happen'd.

When we enquire into this, another thing, also, must of course be enquir'd into, which the observation of Platerus (*i*), relating to the volvulus likewise, affords us a handle for the investigation of, I mean whether worms are viviparous. For he saw the intestines of a boy, or rather of a young man, surprizingly convoluted, twisted, intangled, and distended, not only with excrements, and flatus, "but also with living worms, oblong in their figure, and in great number, which were again fill'd with other lesser worms." You will also read this observation in the Sepulchretum, not only in the fourteenth section which we are at present upon (*k*), but also in the twenty-first (*l*), and you will the more attend to it, if you light on the dissertation, in which the skilful physician Zamponius describes to the celebrated Plancus, a worm which was discharg'd by another boy, and which brought forth, under his very eyes, soon after, many small living worms to the number of eight and twenty. But all these things relate to the round worms.

37. For as to what I remember to have read of the tæniæ, and ascarides, just as if they perform'd the office of ovaria, or rather of a uterus, to the others; either I am much deceiv'd indeed, or the question is of such a nature, that makes it very needless for me to convals it, as this also is, whether "the tæniæ are ascarides, that are mutually join'd to each other," especially as they who assert it, confess, "that the ascarides are lodg'd only in the intestinum rectum," and in like manner, whether the ascarides "are worms proper, as it were, to the human body; whether other species of worms are "very rare," and other queries of the like nature, which, in my opinion, ought to be interpreted differently, as they, at the very first sight, seem to show.

(*e*) Comment. in eum. l. n. 105.

(*f*) Tom. 6. obs. 93.

(*g*) Obs. 39.

(*h*) Obs. 7.

(*i*) L. 3. obs. ubi de extuberantia.

(*k*) Sub n. xxi. §. 1.

(*l*) Sub n. xxii. §. 4.

At least Vallisneri (*m*) did not doubt but the tænia was made up of *vermes cucurbitini*, worms which he thus call'd in common with others, and which laid hold of one another mutually, using among others the simile, that I see even Homer had made use of formerly (*n*), for another purpose; I mean that of bats, which hanging from a rock, in the recess of a great cave, are mutually held by each other. But I have often wonder'd that the opinion which Vallisneri patroniz'd, could not be confirm'd by me, in so many teniæ which I have accurately inspected, and examin'd, and these taken from quadrupeds, fishes, and birds: and thus you will easily perceive, if you read attentively the observations which I have publish'd, in the fourteenth of the Epistolæ Anatomicæ (*o*); and even if you read that which Vallisneri formerly publish'd, with my letter which was written to him (*p*): from which observations, it will rather seem to you to be gather'd, that each of these teniæ are distinct long worms, than a concatenation of many. But now I have ceas'd to wonder, since I have learn'd that by the industry of the celebrated Winslow, a duct is, at length, found out, and clearly prov'd, by an injection of a very fluid matter, which went through the whole length of the tenia.

If this duct had been known at the time in which I, or Vallisneri, wrote, and the experiments had been publish'd, by which it appears that aquatic worms, divided into many parts, had liv'd about three months, without any nourishment; and, by a new observation, it had also been made probable, in another species of teniæ, that in the very slender extremity, which seem'd to be the tail, was the head of the teniæ; not only I should more readily have understood what I saw, but he would have sought out other arguments to support his opinion, or rather, as he was a man very studious of truth, would have entirely discarded it.

But these things that I have mention'd, have come forth since that time, as you will learn from the dissertation, of the very experienc'd Bonnet, upon the tænia, which is written accurately, learnedly, and ingeniously, and which was presented to the Royal Academy of Sciences at Paris (*q*). This dissertation will perhaps furnish us with an occasion of enquiring into other things, at some future opportunity. But now, still keeping my subject in view, I return from these disquisitions, which came accidentally in my way, to my original intention, as I see that some things still remain, out of those which relate to pains of the intestines, which deserve consideration, and are desirable to be known; but as this letter is already very long, I shall defer what remains to be said on this subject, to the next. Farewell.

(*m*) Consideraz. int. alla generaz. de vermi
&c.

(*n*) Odyf. l. 24. sub initium.

(*o*) N. 47. usque ad 55.

(*p*) In calce modo cit. libri.

(*q*) Memoires presentés à l'acad. r. des sc.
tom. 1.

LETTER the THIRTY-FIFTH

Concludes the Discourse upon Pains of the Intestines.

IT is true that I have compris'd in the last letter, a great number of examples of pain in the intestines, and of the inflammation and gangrene that are the consequences of it. Yet other examples still remain, which so much the more deserve attention from you, and other junior physicians, as you will find that the patients were snatch'd away in a shorter time, or under a more deceitful appearance of remission. I shall begin with these of the first kind, and even with the case of a young man, who was extremely well-known to me, when I was at Bologna, and whose disease was so rapid in its progress, that I had scarcely heard of his disorder before I heard of his death. And the following is the narration of the case, for it was not written by Valsalva, but deliver'd to us from his own mouth, at the time in which it happen'd.

2. Lælius Lælii, a native of Imola, in the papal territories, a student in medicine, was a lover of solitude, and by nature easily irascible: this young man, when he was in good health as usual, without any previous cause, except that he knew his father was then at the point of death, and expected, every hour, the melancholy news of his having actually expir'd, was suddenly seiz'd, about the fourth or fifth hour of the night, in the middle of November, in the year 1705, with a violent pain in the umbilical region, which sometimes was most troublesome in one part, and sometimes in the other, but never went out beyond some certain space of that same region. The person with whom he lodg'd being wak'd by his cries, gave him, according to the advice of some neighbouring physician, a dose of *Philonium Romanum*. This was thrown up by vomiting; for he had already begun to vomit a porraceous bile, which afterwards became æruginous, and at length, when he was near death, black, yet still so as to be inclin'd to a feruginous colour.

In the morning, about ten hours after the beginning of the pain, Valsalva was call'd to the patient. Who, observing an unpromising aspect in the face, an abdomen tense, and painful to the touch, a low, and as it were constricted pulse, which could hardly be felt, a urine of a red colour degenerating into brown and extremely turbid, and other things of this kind, and seeing that so much mischief was done in so short a time, and calling to mind other observations of his, of disorders not much unlike this, pronounced.

mounc'd that he would die within the space of twenty four hours. Yet that the patient might not be immediately sensible of this, he order'd fresh-drawn oil of almonds to be given internally, and the belly to be anointed with oil of violets, with the addition of camphor, and two senior physicians to be sent for. These gentlemen coming four hours after, he said to them, you will see a young man, a worthy-fellow citizen of mine, struggling with so oppressivè a disorder, that unless you can administer some relief, I fear he will not be able to bear up under it long; for, in regard to myself, I ingenuously confess, I do not see wherein I can assist him. At the same time he relates the case, and introduces them to the patient.

After having examin'd into the symptoms, it was their opinion that he was oppress'd by a convulsion, and that, therefore, blood should be taken away from his foot: and that a large cupping-glass should be fix'd to the abdomen. Valsalva was averse to the idea of blood-letting, but as he deliver'd his opinion with modesty, he was overcome by the contrary opinion of the senior physicians. A vein was twice open'd: from the first orifice no blood at all came; from the second, blood did, indeed, spring forth, but immediately lost its impetus, and came out in so languid a manner, that although the orifice was soon after tied up, the pulse could no more be perceiv'd. A slight delirium afterwards came on: the eyes show'd something of a convulsive appearance: the respiration became difficult: and, finally, death came on, according to the prediction of Valsalva, in the following night.

Valsalva, when he put his hand on the abdomen of the carcase, perceiv'd that there was an extravasated humour in that cavity. It was a fluid blood, which had been effus'd to the quantity of about a pound and half: and some blood was also extravasated into the bronchia. However, in the belly was a strong smell, but not to a very great degree. The intestines were, in a great part of them, red in several places, especially those which lay uppermost in the abdomen; and the ileum had already begun to be livid. The peritonæum was mark'd with black spots, in several places, but particularly where it invests the diaphragm. But where it cover'd the stomach, which had a natural appearance on the internal part, it was unequal with black tubercles, rather than with spots. And these tubercles, although at first they had the appearance of glands, were in fact (for Valsalva himself show'd them, and I saw some of them soon after) nothing else but a stagnating blood, or, if you please, rather the beginning of a gangrene.

3. When he had shown me these appearances, and, at the same time, related the case, as I have describ'd it to you, I ask'd him why he had neither prescrib'd bleeding himself, nor approv'd of it when others prescrib'd it? He answer'd, that he had no reason at hand, which would clearly satisfy me; but I have, says he, observation. For I have remark'd that blood-letting does not succeed well in inflammations of the bowels: and indeed I have even often observ'd, that patients, of themselves, become exceedingly bad of a sudden in that disorder, and contrary to expectation, so that I am afraid to make use of any remedy of this kind, lest the blame should be laid upon the remedy, which ought to be laid upon the very nature of the disorder.

What then, you will naturally say, when you read this, If any one is almost loaded with a quantity of good blood, if his constitution is strong, and firm, and he be seiz'd with a very violent pain in his intestines, must we, upon the authority of Valsalva, omit to take blood from him? What is this but to suffer an inflammation to continue, which it would be easy for you to prevent? What! If the pain is from a convulsion, must we not endeavour to counteract this by bleeding, but must we even suffer the vessels to be the more dangerously contracted, in proportion as they are more full? Softly, I beseech you; for who has told you, that in such a man as you describe, Valsalva would not have immediately taken blood away? For it is quite a different thing, to open a vein before an inflammation is form'd, or even while it is beginning to be form'd, and especially in a constitution of this kind, from what it is to take blood away when the inflammation is already form'd, when the strength of the patient is diminish'd, and every thing is in a very critical situation; or in other words, to run the risque, as Celsus says (a), "of seeming to have kill'd the patient," who must have sunk under his own severe fate." For the course of this disease is often more speedy than we should suppose; so that if you regard the hours, you would think it in its beginning, even at the time when it has done all the mischief in its power, and is hastening to its fatal conclusion: wherefore in this disorder, if in any other whatever, that Hippocratic maxim (b) is true, *occesso præcepit*: for short indeed is the opportunity of relief. There had been this opportunity in Lælius, during the first hours of his disorder, when the philonium was rashly, not to say to no purpose, advis'd. When Valsalva came to him, this opportunity was pass'd, and still more when the senior physicians were call'd.

4. For as to their thinking, from these very symptoms, by which Valsalva judg'd the young man to be overcome with the force of a disorder, which was already become insuperable, that he was oppress'd by a convulsion, which they believ'd to be as yet moveable; without doubt the success of venæ section, shows plainly, which opinion came the nearest to truth.

I confess, however, it cannot be denied, that in this disorder convulsion has frequently a great share, and this convulsion is so much the greater, in proportion as the pain is more severe, whether the pain excite the convulsion, or is excited by the convulsion, and also in proportion as it makes the greater speed to its fatal termination. Thus I understand why Boerhaave (c) has accounted for the exquisite sense of the intestines, from their great number of nervous papillæ, and immediately adds: "wherefore persons are very soon destroy'd by inflammation, and excoriation of the intestines, and if there be a very great violence of pain, the strongest man is dispatch'd in the space of a single hour." But frequently, also, in a violent pain of the intestines, manifest marks of convulsion discover themselves, even more than in Lælius (d).

Thus, not to mention here the horrid convulsions, that are describ'd in an observation (e), which, whether you consider the symptoms, or the dis-

(a) De medic. l. 5. c. 26.

(b) Sect. 1. aph. 1.

(c) Prælect. ad instit. §. 91.

(d) De quo supra n. 2.

(e) Eph. n. c. dec. 3. a. 7 & 8 obs. 145.

section, certainly relates to the present subject; thus, I say, I remember a virgin in the place of my nativity, pretty far advanc'd in years, but of a strong constitution, who was subject to a pain in the belly, which her senior physician did not doubt was a colic, and who, being seiz'd with the same pain, but more violently than usual, about the end of the year 1709, yet without any symptoms of fever attending it, whether you consider'd the pulse, the urine, or any other marks, was very much eas'd by a glyster, which had brought away a bilious matter, and her disorder grew milder every day, so that she was no longer visited by her physician; I remember, therefore, that when the women, who attended the patient, had, instead of a glyster, which had been injected every other day in the evening, introduc'd a suppository of honey, she was immediately seiz'd with so violent a pain in the anus, that in the morning no pulse could be found: and that with this pain, was join'd so great a constriction of the anus, that a glyster could by no means be injected: but soon after, when they endeavour'd to cure this contraction, and pain, by emollients, and anodynes, I remember that all of a sudden, a relaxation of this part came on, just as it frequently does in bodies after death, and about noon, death itself.

Suppose then, that this disorder was a convulsion. And will you suppose it could have been easily remov'd by blood-letting? What if such a cause vellicate the nerves, as it is very difficult to overcome, or if it can perhaps be overcome, for a very short time, it soon after attacks the patient in a more violent degree, as is frequently the case in convulsive disorders? Attend to what happen'd when I resid'd at Bologna. There was a monk, who was an old man indeed, but very strong. This man was seiz'd, of a sudden, without any evident cause, except, perhaps, from cold, and fatigue, with a pain in his belly, which was so violent that he could not stand in any one place, and was forc'd to cry out. Oil of almonds was given to no effect, glysters were injected without the least advantage, and blood drawn from the foot. No remedy being of any use, he died within twelve hours at least, having gnash'd his teeth two or three times.

I do not write these things against blood-letting, which, if you use it in time, is a very useful remedy. But I put you in mind of what may soon happen, in disorders of this kind, even after that remedy has been made use of, when very violent convulsions prevail: and this that you may know, yourself, and previously inform others, that an important remedy is not to be rashly blam'd, if it happen that a fatal termination of the disease soon follow its use. But as, whatever previous admonitions are given, it is always a reproachable calamity with most persons, if a speedy death succeed a considerable remedy that has been made use of, you plainly understand why Valsalva was afraid of the use of remedies of this kind, in these diseases.

5. But what if the diffiction of the body take away all excuse from the physician? For a convulsion, although it does not return, may nevertheless have brought on such a disorder in the intestines suddenly, and contrary to expectation, by obstructing the blood in the constricted vessels, that during this constriction blood cannot be taken away with propriety. You have seen, in the case of Lælius, how soon the intestines had not only contracted an inflam-

mation.

ination, but a lividness likewise. No part perhaps, more easily, and sooner, than the intestines, degenerates into a gangrene, and becomes black, without the physician's suspecting any thing of that kind. Which, although I could still more properly demonstrate it by histories that are elsewhere produc'd, or will be produc'd in this letter (*f*); yet I will also show here, by two observations that I receiv'd from my two preceptors, the one from Valsalva, and the other from Jacob Sandri. And first take this from Valsalva.

6. There was a man, who for some months, at least, had been seiz'd every day, five or six hours after eating, with pains of the belly, as if he were torn by dogs. To this was added a flux of yellow matter, and a wasting of flesh; when, of a sudden, he was attack'd by an apoplexy, which was slight indeed, and after a day or two seem'd to remit, so that his hands recover'd some power of motion, and his senses were less oppress'd: yet he died on the fifth day.

His body being examin'd, every thing appear'd to be sound, if you except the brain, and the intestinum ileum. For in the ventricles of the former, was a large quantity of serum, from which the plexus choroides had become pale. And in the ileum were seven or eight annular spaces, and those of a black hue: in which spaces were glands of the bigness of a vetch, and most of them fill'd with a white matter: these glands were not collected into heaps, nor plac'd on the internal surface, but were scatter'd abroad distinctly from each other, and were rather prominent betwixt the coats of the intestine.

7. The cause of the apoplexy, as it does not relate to the present subject, being set aside, you see that the cause of the pains which recurr'd every day at a certain hour, consist'd, without doubt, in the enlarg'd glands of the ileum, whether they, as Valsalva thought, by what he had seen in some other instances, could not bear the pressure of the nutritious matter, as it pass'd through the intestine, without pain; or were distended by the new chyle, which was unable to struggle through the narrow passages of these glands, that were in part obstructed: which both the nature thereof, that to Valsalva seem'd not unlike that of the glands in the mesentery, shew'd; and that white matter with which most of them were stuff'd up, in some measure confirm'd.

But what I would have you principally attend to here, is, how easily, and how soon, all these spaces, in which they were, contracted a blackness. But you will say that the apoplexy had increas'd the inertia of the fibres of the intestine, and prevented them from dispatching the blood with so much celerity, through those spaces, which were vitiated by the glands. I confess it: but a gangrene is not us'd to seize upon other diseas'd parts so soon, when an apoplexy comes on. And certainly no apoplexy had preceded in the other observation, which Sandri related in the following manner.

8. N. Cupellini being afflicted with a colic disorder, was sitting down on a chair, and drinking an emulsion, when, all of a sudden, he said to his servant, who was standing by him, take it, stretching out, at the same time, the glass which he held in his hand; and as he said this, he fell backwards,

and died in an instant. The whole body being examin'd by dissection, no disorder was found, besides an inflammation of the intestinum colon, which inclin'd to blackness.

9. From this observation you not only see what I advanc'd, but also perceive what disorder there certainly might be in the same intestine, in the virgin of Forli, also, of whom I spoke just now (g). And I would not have you be surpriz'd that there were no previous symptoms of a fever; as we are about to see in this very letter (b), whether there can be an inflammation without a fever, and even whether there can be a sphacelus without an inflammation. But we must first consider such things as relate to the celerity, with which the intestines contract a fatal inflammation.

10. A certain running footman (that is to say he whom I have taken notice of in the fifteenth of the *Epistolæ Anatomicæ* (i), where I wrote other things of him, which I shall not repeat here) of a low stature, and a fat habit of body, being no longer able to do business as a servant, beg'd for his livelihood some years, and made very plentiful use of wine, when he could get it. Wherefore even on the last day of his life, when he came home, and said that he was not well, he took nothing to cure himself but bread and wine, soon after which complaining of pains in the belly, he died with them about midnight. His body was brought on the day following into the college, where about the beginning of February, in the year 1736, I taught anatomy.

The muscles of the abdomen, which were lax, being cut into, and the belly, from whence a very strong smell proceeded, being laid open, I saw that a very considerable part of the small intestines went down, to a considerable depth, into the lower part of the pelvis, so as to reach quite to the conjunction of the bladder with the rectum, filling up all the space that was there. But that appearance had existed from the original formation of the body, or at least was not recent. This however was recent, that these, and the other parts of the small intestines, were, in some places, extremely narrow, and, at the same time, brown, but in other places red, even the smallest vessels being so much distended from the stagnating blood, that it almost seem'd as if they had been fill'd with an injection of red wax. And the same appearance was seen in several parts of the large intestines, but especially at the beginning of the colon. The edge of the liver was blackish. The spleen was larger than it naturally is. The trunk of the great artery, as it pass'd through the belly, was not free from some little ossifications. And the vena cava was fill'd with much fluid and black blood.

11. It is true it was not so short a space of time, in which the inflammation of the intestines carried off the woman, of whom I am to write next: yet it was short, and perhaps shorter than it seems, if it were as certain when the inflammation began, as it is when she first began to be disorder'd at all. But although this is not so clear, yet the other remarks that I made upon this woman, I must not pass over here, as I promis'd them when I wrote of

(g) N. 4.
(b) N. 19. & seq.

(i) N. 70. ad fin.

the palpitation of the heart (*k*), and of the pulse (*l*), and even when I treated of the affections of the eye (*m*). For this is the old woman, whose disorders I describ'd in that place, only as far as they related to her eyes, and defer'd the remaining part of the description to another occasion.

12. A poor old blind woman, of a small and slender body, having been ill for three days, was brought into the hospital at Padua, being suppos'd to labour under an inflammation of the thorax. For from the patient herself nothing certain could be learn'd, as she was then very weak, and her pulse so very low and small, that she was carried out dead, on the very same day she had been brought in. This woman's body, as the time of the year was suitable, for it was about the beginning of the year 1742, was more useful than I expected, in order to demonstrate many things to the students. And in the course of those demonstrations, I lit on these morbid appearances, which I shall take notice of.

In the belly the intestines were inflam'd, as the liver was also. And to the same cause it was to be ascrib'd, that when the uterus was open'd, the internal surface of the fundus was of a colour not less red, than if the woman had lately menstruated. But where the fundus contracted itself into the cervix, and the anterior and posterior internal surfaces came together, and form'd an angle in the right side, a membrane proceeded from this angle, not very small in its size, and pass'd transversely to the posterior surface, universally cohering with that surface, on its inferior border, but being, in other respects, loose and floating, so that, contrary to the usual appearance of the *valvulæ cervicis*, it had its cavity turn'd upwards, and not downwards: for which reason I suspected that this had not existed from the original formation, but had, perhaps, been the consequence of a difficult birth; for it was certain the woman had brought forth children, and I saw the uterus inclin'd to the right side.

In the thorax the lungs were perfectly sound. But the pericardium was, on all sides, connected to the heart, by a universal, though not very firm cohesion, so that the two membranes, that is of the heart, and pericardium, could easily be disjoin'd from each other, by dividing these connections with the fingers, and without lacerating either. The pericardium did not adhere to the great vessels: but on the surface, by which it had adher'd to the heart, appear'd a certain white spot, only in one place, and that extending itself to a small breadth only. In the ventricles of the heart was some blood which was black, as indeed the blood was every where, but there were no poly-pous concretions in these cavities. Yet in other parts of the body these concretions were found, round in their figure, and white, and some thick, firm, and long, as those were which went from the right auricle, to the internal jugular veins, and those, also, which were produc'd from the orifices of the heart into the arterial vessels. Finally, what appearances were found in the eyes, I have already said in that letter which was last pointed out.

13. Although the histories which I have hitherto given you, show how soon pains of the intestines may, sometimes, become fatal, either by the force of inflammation, or even of convulsion; and consequently, how cautious a phy-

(*k*) Epist. 23. n. 21.

(*l*) Epist. 24. n. 12.

(*m*) Epist. 13. n. 17.
fician

fician ought to be, and even fufpicious, during the violence of this difeafe: yet that he ought to be much more cautious, and fufpicious, left he fhould, at any time, be deceiv'd into a vain hope by the feeming remiffion, and, as it were, departure of this diforder, the following obfervations will fhew you.

14. A young man who was much given to the ufe of wine, and fpirituous liquors, as they are call'd, having labour'd under an intermitting fever, not long before, was seiz'd with a pain of the belly, which a difcharge of flatus, downwards, remov'd. However, after fome days, the pain return'd again; which not being able to get rid of at home, he was, at length, receiv'd into the hofpital of St. Mary de Vita at Bologna, on the fixth day after the return of his pain. The pain was continual in the hypogaftrium, but flight, except that it now and then increas'd, and the belly was often, at thefe times, more fwell'd in that part, and if you applied your hand to it, you perceiv'd many hard globules, as it were, feated in that region. But all thefe fymptoms foon vanifh'd; yet return'd again, at intervals. The ftomach alfo was painful, and he now threw up all his aliments by vomiting, as well as his medicines, among which was even opium itfelf.

Wherefore, as the inteftines difcharg'd none of their fæces, but by means of glyfters, it was determin'd to pay a regard to this circumftance and, at the fame time, to inject fomething of a curative and nutritious nature in the glyfters, as broths, for inftance, and decoctions of emollient herbs, but this was done without any alleviation of the pains, fo that no excrements were brought away, before linfeed oil had been more than once thrown up. Unctions of the belly with the fame oil, and others, were, alfo, tried without effect. The patient bore the pain better when he fat up in the bed, than when he lay down, for which reafon he fat up even when he fleep'd. He was alfo better, and fleep'd better, with an empty ftomach, than if he happen'd to keep any thing down: which circumftance, and the abfence of fome other fymptoms, that frequently fhew the exiftence of worms, made us fuppofe that the pain did not arife from worms, notwithstanding he had thrown up one very long, and round worm, from his mouth, three days before.

At laft he began to retain fome of his nourifhments, and even his dinner alfo. His cheeks were red, which he himfelf faid was owing to a defluxion of humours on his face, to which he had been fubject. He was thirfty. His abdomen was univerfally diftended. It was now the fifth day from the time of his coming into the hofpital, and I fpoke to him, as ufual, about the fixteenth hour, for the winter of the year 1703 was coming on: he faid that he was a little better, which was confirm'd by his countenance, and alacrity of fpeech, and by a more firm vigor of the body, in fitting; for the pulse never had had any difagreeable fymptom, nor had even then: at leaft there was no fever, nor could any ever be obferv'd, during the whole courfe of his being in the hofpital, except, perhaps, once. And from this ftate of ~~the~~ diforder who could have fuppos'd that any thing fo fatal was at hand? Yet fcarcely two hours had paß'd, from the time that I, and the ftudents who faw him with me, had made thefe obfervations, when he began, of a fudden, to cry out from a feverity of pain, and that continually even to the ninth hour of the night. In the mean while he had a vomiting, and in the evening he himfelf gave notice that his pulse could no more be felt, nor indeed could it

be perceiv'd, by those who were present. When it was the ninth hour, to which time, as I said just now, his pain continu'd, he said that he must get out of bed, in order to have a stool. And while he was about this business a swooning came on, and he died, in this manner, within half an hour.

While his body was wash'd, on the day following, a great quantity of putrid blood, as it were, flow'd out of his mouth, diluted with a stercoraceous fluid, of the colour of tobacco, and smelling very strongly. And by this means the abdomen became somewhat flaccid in the hypogastrium: and although in the epigastrium, which was livid, and in the other parts, it was still hard, and distended, yet it was less so than it had been in the living body. When the knife penetrated to the cavity of the belly, a great quantity of fluid immediately burst forth with an impetus, being similar to that which had flow'd from his mouth; and it burst forth in such a manner, that it was doubtful, not only to us who stood by, but even to the person who perform'd the dissection, whether it came from the cavity of the abdomen, into which it had been before extravasated, or from the distended intestine, which, in consequence of its distention, might easily be wounded together with the peritonæum.

However, soon after, when the abdomen was fully laid open, the cavity thereof appear'd to be full of that humour. The small intestines were all as black as a chard-coal. And the spleen, also, was affected, or at least in part, with the same sphacelus. Yet the stomach, as far as could be judg'd from the external appearance, was sound, and all that part of the large intestines, likewise, which goes from the termination of the ileum, to the left hypochondrium: for we were prevented from inquiring into other appearances, by the almost inconceivable ill smell; which was so much the greater, as through negligence, and haste, the intestine had been perforated, whereby the filthy proluvies was increas'd, with which a round worm, of a moderate size, had also come out.

15. You have seen how much disorder there was in all the small intestines, when the young man seem'd to be better. But do you imagine this mischief was done before he came into the hospital, or afterwards? If before, then of course this very great disorder lay hid for five days, without those symptoms which generally attend upon a sphacelus. And if you suppose it to have happen'd afterwards, how did it all come on without signs of inflammation, and particularly without a continual fever? And suppose that almost the same questions may be ask'd you by me, when I produce the observations which follow, or when you read that of Segerus, which is extant in this fourteenth section of the *Sepulchretum* (*n*). That is to say, an old man after having complain'd, for some days, of pains in the belly, to which he was subject, yet not so violent, as to confine him to his bed, at length returning home about evening from his garden, his pains became so violent, that no remedies were of service to him, and he died, on the following day, about the fourth hour in the morning: and indeed other diseases of long standing were found in the pancreas, the liver, and the spleen; but this one was recent, that

“ the intestines, particularly the small ones, and the colon, were very “ black.”

Is it possible then that all this mischief could happen within a few hours, from the time that Segerus had found the pulse to be somewhat more quick than usual? But in regard to this I will also consider below (o). At present, to return to our young man, if it had been certain that the very foetid colluvies, which I have mention'd, had been previously effus'd into the cavity of the abdomen, by a rupture of the intestine while living, and not from a wound of the intestine after death, as we had some reason to suspect, we should then conjecture that the swooning, and death which was the consequence of it, had probably happen'd at the time when in the strainings to discharge the fæces, he had broken through some rotten part of the distended intestine. For Wepfer, also, as you will likewise read in this section of the *Sepulchretum* (p), speaks of “ the intestines being ruptur'd, and all the *fordes extravasated* into “ the cavity, with the sudden death of the patients.” Which, however, does not always necessarily follow, as two observations in the same section of *Fernelius* (q), and *Riverius* (r), jointly demonstrate: and the same may be gather'd from one of ours describ'd in the former letter. But whether those which you read in the *Commercium Litterarium* (s), and in the *Acts of the Cæsarean Academy* (t), belong to one, or to the other class, I leave to your own prudence to determine. To the former class, however, belongs that which was lately given us by the celebrated *Galeati* (u); so suddenly was the man carried off by tormina of the intestines, and so full of excrements was the abdominal cavity, likewise, found, which had been discharg'd from the ruptur'd intestine.

But now let me give you a lamentable history, in which the pains had not only remitted, but entirely gone away.

16. A slender woman of a short stature, and of a bilious temperament, as it is call'd, being about forty years of age, and having been a widow for three years, was accusom'd to spit blood now and then, which she attributed to having been without her menstrua, for eight years past, though to me it seem'd that this blood came from the larynx rather than from the lungs, when, at length, from anger, and uneasiness of mind, she was seiz'd with a pain, on account of which she was oblig'd to come into the hospital of St. Mary de Morte, at Bologna, about the beginning of March, in the year 1706. This pain seem'd to be from the cutting of knives, as it were, first below the left breast, from which seat it extended itself, afterwards, without quitting it, to the part below the right breast, where it was more slight however, so as to suffer the patient to lie on that side. For it increas'd from the part being touch'd: and made respiration difficult. It had begun with a febrile rigor, which recurr'd every day; but the fever did not intermit. The face was red: the thirst was troublesome; but the cough still more so, as it exasperated the pain. The spitting was frequently bloody, at other times white, thick, and frothy. There was often a sensation as if of something

(o) N. 19. & seq.

(p) In addit. obs. 3.

(q) 23 & 21. §. 4.

(r) N. 9.

(s) A. 1742. hebd. 45. n. 2.

(t) Tom. 8. obs. 47.

(u) Comment. de bonon. sc. acad. tom. 3. inter medica.

ascending to the throat. And, finally, there was a pain about the navel, just as if dogs were tearing that part. The belly was lax.

Blood was taken from the foot: and other remedies, which were suppos'd to be serviceable, were administer'd. After a few days, without any previous critical evacuation, all the symptoms were grown so much milder, that the physician pronounc'd the patient already well. In consequence of this she got out of bed: but her strength soon failing her, she was presently oblig'd to return to her bed, where she was found contracted into herself, as we generally are from cold, and without any pulse. She was ask'd whether she felt any pain in the thorax, or belly, to which she answer'd in the negative. On the same day she began to discharge a fœtid blood by stool. She was afterwards delirious: and convulsive startings of the tendons discover'd themselves in the wrists. Being much weaken'd by these symptoms, so that she was no longer able to speak, she died on the sixteenth day from the beginning of the disorder.

The abdomen which had subsided, being cut into, and laid open, a fœtid smell was discharg'd, such as generally comes from a gangrene, but mix'd with that odour, which where there are worms seems to be emitted from an acid matter as it were. Nor indeed were round worms wanting in the small intestines, all of which, from a red colour, inclin'd to a livid and blackish hue. The same morbid lividness occupied the flat surface of the liver, on the lower part of it, and penetrated pretty far into its substance. The pancreas being become thicker than natural, consist'd of indurated globules, as it were. The liver, also, was somewhat hard, and the gall-bladder was distended with calculi, to the number of a hundred and twenty, which were contain'd in a palish bile.

The largest of these, which were about twenty in number, were equal to the bigness of a filbert. Other circumstances relative to these calculi, I have describ'd in the *Adversaria*, in the first place (x). Where (y) something is also said of the situation of the uterus in this widow, which was so drawn to the right side of the pelvis, by the round ligament being shorter than usual, that the middle of the pelvis was without a uterus. Moreover, where the tube emerg'd from the uterus, on the left side, was a prominent pustule, turgid with a white pus, equal in size to a lupin; and the substance of the uterus, which the pustule had hollowed out, appear'd to be black after the pustule was open'd, and the pus discharg'd. The tubes contain'd a matter which was not white, but of a fleshy colour degenerating into yellow. The testes were contracted, and had a few vesicles within them; and the coat of one was almost cartilaginous.

On opening the thorax, we found the lungs, on their anterior surface, connected in a few places to the pleura by membranes, but in other places free, and found also, if you except the anterior part of the right lobe, the substance of which was somewhat compact, but not very hard. There was no moisture in the pericardium: but in the right ventricle of the heart, which was flaccid, and at all the orifices of that viscus, were small polypous concretions.

(x) III. animad. 28.

(y) IV. animad. 25.

As to the parts of the pharynx, from whence the bloody spitting had proceeded, I have spoken of these in the *Epistolæ Anatomicæ* (z).

Finally, when the head was sever'd from the neck, a small quantity of water issued forth, through the great foramen of the occiput: and some water was also found under the pia mater, when the cranium was open'd, particularly on the right side. In the lateral ventricles of the cerebrum was a reddish serum, and the plexus choroides were unequal, with a great number of hydatids, which were easily broken through by touching them. From the sections of the medullary substance, where some bloody points were discover'd, a greater quantity of blood was press'd out than there generally is. From this cerebrum, as also from the tongue, the pharynx, and even from the very eyes themselves, which I dissected, the same kind of odour of worms was perceiv'd, that I spoke of in the belly.

17. If you set aside what relates to the delirium, to the convulsions, to the spitting of blood, to the pains of the breast, and the other disorders, which are not the objects of our present inquiry, and only consider the pains of the intestines; you will easily conceive, that when these as well as the other symptoms, had so greatly remitted, without any critical evacuation preceding, that the woman was suppos'd to be recover'd, nor she herself longer felt any pain, the intestines had then begun to grow livid, and black, which the discharge of a foetid blood by stool, beginning on that very day, to say nothing of the asphyxia, join'd to demonstrate.

Nothing in the whole practice of medicine, ought more to be suspected than the sudden vanishing of pain contrary to our expectation. I remember that the very sagacious, and experienc'd physician, Peter Molinelli, whom I have commended in the life of Valsalva, related to me a recent observation of his, to the same effect. A young man of a melancholic temperament, was seiz'd with an acute fever, with an inflammation of the jaws, and a delirium. About the fourteenth day all the other symptoms, besides the fever, left the patient, but that continu'd, and was constant; and although the patient perspir'd plentifully, and made a good deal of water, yet the fever, except that it seem'd to have been absent for one day, ran on quite to the thirty-fifth day. As Molinelli suspected, from the obstinate perseverance of the fever, even after so great a discharge by sweat, and urine, that some very considerable disorder was lurking beneath it, behold without any previous irregularity of the patient, or the attendants, an æruginous diarrhœa suddenly came on, which was attended with a pain a little above the region of the bladder. And as these symptoms came on suddenly, so they as suddenly vanish'd.

Then indeed the physician began to fear something very violent, and not without reason. For the whole abdomen was harden'd to an incredible degree, with a sense of internal heat, and, when you touch'd it, even of pain: at the same time there was no pulse, a delirium came on, a difficult respiration, and, without signs of convulsion, death within the third day, from the time the abdomen had grown hard. And although he was surpriz'd, how an inflammation could arise from blood, which was effete, as it must necessarily be, after a very long, and violent illness; yet that it was arisen he did not doubt;

and I did not doubt but a gangrene had arisen also. But what it was not possible completely to ascertain, by reason of the liberty of opening the body of this young man being denied, it was possible to ascertain in a woman of the first rank, whose history being communicated to me by one of her physicians, should not be pass'd over here, as it was very much like those which are describ'd above.

18. A very great princess of fifty-four years of age, who was not fat in her limbs, but very fat in her belly, in whose pulse it was remarkable, that after every two laudable strokes, immediately follow'd as many strokes that were low, and of unequal celerity, having seem'd to be recover'd from a very violent pain of the intestines, which drew the bladder into consent, and prevented the power of making water, was, a very few days after that pain had left her, seiz'd with a diarrhoea, by which stools of a black colour were discharg'd, and soon after with death.

The belly being open'd, some of the intestines, and the stomach, were found to be affected with a gangrene; the gall-bladder was dry, and in it was a calculus of the bigness of a small pear: in the kidneys were rather granules of sand than calculi. In the thorax the heart, and pericardium, were over-loaded with fat.

19. Whether this oppressive quantity of fat, or even something hereditary, as those things which I remember to have read, formerly, of the king her father, seem to prove, was the cause of that inequality of pulse, I should at least think that the gangrene of the intestines was to be attributed rather to the foregoing inflammation, when the pain troubled her, than to the discharge of atra bilis, as it is commonly call'd, by stool. For this discharge had not infected the stomach; and in the widow of whom I spoke just now (*a*), black stools preceded her death, which did not consist of atra bilis, but of putrid blood.

Yet it is not very probable, you will say, that many experienc'd physicians, and especially such as are generally call'd upon to attend princes, did not distinguish an inflammation, nor the degeneration thereof into gangrene. And as it is my custom to judge of others, and particularly in a disorder which I did not see myself, as I would have others judge of me, I will here, also, preserve my custom of accusing nobody rashly; and unless you dissent, I will say that this gangrene came on without any previous inflammation. And this I shall do under the countenance of a great authority, I mean of Fernelius (*b*), who, after a very violent pain, saw "the extremity of the foot suddenly sphacelated, without any conspicuous redness, so that the patient was, at length, carried off without any fever, without any very violent symptoms." Although therefore, "the greater part of physicians think that sphacelus is the indivisible consequence of violent inflammation," yet from considering several observations, which are very similar to that of Fernelius, Frederic Hoffmann has expressly said (*c*), "wherefore there is no reason to doubt, but the same thing may happen internally, in the viscera, also, without a previous inflammation."

(*a*) N. 16.

(*b*) De abdit. rerum caus. l. 2. c. 15.

(*c*) Dissert. de morb. hep. ex anat. deduc.

§. 19.

But if you want instances in the intestines themselves, you may read over again the observation of Segerus (*d*): or rather, as in his observation there was a very violent pain observ'd, and a very quick motion of the artery, turn to another of Frederic Ortelobius (*e*), which is also to be met with in the Sepulchretum (*f*): you will find that the intestines were "livid, black, and "sphacelated," on the right side, and that, as Ortelobius himself wonders at in the scholium, "without previous pains of the belly, and without a previous manifest fever."

20. Yet even as in the patient of Ortelobius, "obscure pains" of the belly had preceded; and as there is nobody who can assert of him, as Fernelius did of the foot of the other, whom I spoke of just now; or who can ascertain, as in the external parts in general, that a "conspicuous redness" had not preceded, in the viscera also, you will not deny that a sphacelus of the intestines may, sometimes, happen, without any inflammation preceding; but will at the same time enquire whether it may not, sometimes, succeed to an inflammation, the principal, and common, symptoms of which do not appear.

Not to recede from the Sepulchretum, turn, I beseech you, to the observation of Riverius (*g*), in this very fourteenth section. The intestinum ileum, you will find, was affected about its termination, together with the portion of the mesentery that was join'd to it, with a gangrene, and even with a sphacelus, in a patient who having labour'd under a pain of the intestines, on the first day of his disorder, which was protracted to the thirteenth day, but "being free from pain, and from fever," on the second day, caus'd great doubts and difficulties to arise among the physicians, on the third and the following days, as "the fever which came on after the second day, together with a thirst, and dryness of tongue, seem'd to give "proofs of inflammation; but they could not conceive how an inflammation could exist in the intestines, without pain."

Shall we suppose then that the sphacelus happen'd on the first day? If so, we must, also, suppose that the patient liv'd in this state, for the space of twelve days. And can this be suppos'd? Or how could it happen, that after the sphacelus was form'd, a fever, which did not exist before, and a dryness of tongue, came on? For you will see in the preceding letter, that the pulse of an old man (*h*), was, from a febrile state, chang'd at length to the appearance of a healthy state, and that the tongue, from a dry state, was become moist, although in his body after death we found a part of the intestines still red, and another part livid, black, and occupied with a gangrene, which were pretty sure marks that this part had very lately pass'd from inflammation, to gangrene. But as to pain, other letters of mine testify, that inflammation of the intestines had existed without it.

For to take no notice that in the twenty-ninth (*i*), the intestines are not said to have been troubled with any pain, notwithstanding they were universally inflam'd to a great degree; as I suppos'd this to happen on account of

(*d*) Vid. supra n. 15.

(*e*) Eph. n. c. dec. 1. obf. 143.

(*f*) L. 3. f. 1. obf. 11.

(*g*) Obf. 21. §. 4.

(*h*) N. 25.

(*i*) N. 10. 11.

their being paralytic: they certainly were not paralytic in other patients, as, for instance, in the two who are spoken of in the twenty-first letter (*k*), and yet, although the intestines were found to be inflam'd, no complaint had been heard of pain being therein. And to mention a patient whom you may more easily call to mind, a woman was describ'd in the preceding letter (*l*), whose small intestines were red in the chief part of them; yet they had seem'd to be pretty free from pain. And indeed the other principal symptom of inflammation; which is fever, had never been observ'd in this woman, through the whole course of the disease: and in the porter, whose history was given a little after hers (*m*), the fever, whether you attended to the pulse being not very frequent, or the flesh not hot, was slight; yet the inflammation was not slight; so that there was no room in him, and much less in the woman, for the opinion of Ballonius (*n*), though in other respects to be commended. Who after having said "it was natural to suppose, that a considerable fever must be the consequence of internal inflammations;" yet immediately adhering to the opinion of Galen, "who taught that inflammations of the internal parts must be very great, in order to bring on an acute fever," he says this, if there be a "slight inflammation an ardent fever does not come on."

21. And all these things being consider'd, when together with the other symptoms of inflam'd intestines, you find a violent pain, and an acute fever, attending the patients, you will deservedly, and with justice, give credit to those medical writers, who have plac'd these two appearances among the principal symptoms of great inflammation, in the intestines. Yet if you, at any time, find that one, or both, of these are not present, or but in a slight degree, you will not immediately suppose, either that there is no inflammation, or that it is but slight, and that a gangrene, and sphacelus, cannot exist in the intestines of those persons, in whom you do not see that these two symptoms have preceded. It were much to be wish'd, I confess, that physicians when they have recounted the symptoms of this inflammation, and of a gangrene that is the consequent of it, would not omit this monitum in a disease, which by a deceitful appearance of this kind, frequently brings on a swift and sudden destruction. I say frequently. For I remember, when with surprise I related to Valsalva, and Albertini, the case of the young man which I describ'd to you above (*o*), that both of them, immediately, affirm'd nearly the same thing to have happen'd to them, more than once.

At which time Albertini inculcating upon me, that it was necessary to watch, and be cautious, in pains of the intestines: for that he after slight pains, or at least with those which were by no means considerable, without any manifest fever, without any convulsion, without any vomiting, when both the internal, and external, senses were vigorous, and strong, had seen patients fall very suddenly into the utmost danger, and be soon snatch'd away by a latent inflammation of these viscera, degenerating into an unexpected sphacelus; I say Albertini inculcating these things upon me, I ask'd of that very attentive physician, and diligent observer, from what signs then

(*k*) N. 9. & 17.

(*l*) N. 11.

(*m*) N. 18.

(*n*) L. 1. Confil. med. 112.

(*o*) N. 14.

we might judge of the danger which threatens, and be able to foretell it at least. He answer'd, from the pulse, the abdomen, and the face. For the pulse is low and rather weak, and if you attend to it closely has some little irregularity, which makes it not quite similar to itself: and the abdomen is tense, hard, and attended with some pain: and, finally, the face has something unusual in its appearance, though different in different persons, so that sometimes I have observ'd the eyes to look as if the patient were frighten'd, at other times there has been a kind of lividness about the lips; and these, said he, are the most general appearances that it has happen'd to me to meet with, in cases of this kind; yet I have sometimes also observ'd a morbid appearance of the tongue, and a kind of thirst.

Thus it was that he pointed out the symptoms, with that ingenuousness which was natural to his character. And the truth of his remarks has been prov'd to me by the cases of many, but particularly by that of Thomas Aleotti, a fellow-citizen of mine, who was equally eminent on the account of his noble family, and the probity of his manners. For he being confin'd to his bed, after certain pains of the belly, to which he was subject, and not recovering with the same degree of quickness, that he had been accusom'd to recover with, his physician was sent to me about evening, in the autumn of the year 1711, if I remember rightly, when I was prevented from going abroad by a slight disorder, to consult me upon the case: this physician having told me that the patient was attended with some of those symptoms, which I mention'd just now, and having found out, by the questions I ask'd him, that others were not wanting, I desir'd him, quite contrary to his expectation, to return to the patient, and if he observ'd him to be grown never so little worse, to take care to inform the people about him, that a very considerable danger might be at hand, and that the patient might settle all his affairs respecting both himself, and his family.

You will naturally inquire what was the event? Why a very few hours after, the patient having begun to grow manifestly worse, and having immediately done those things, of which he was at length admonish'd, this excellent man was snatch'd away by a speedy death, within the course of that very night.

22. But as the nature of medicine is such, that the same things do not always answer in the same degree, I would have you make use of what I have said in such a manner, as, if at any time you see the greater part of these symptoms, which I have mention'd, come together, to be at least suspicious of the consequences, and observe the succeeding symptoms with great caution and attention. And in the mean while, perhaps, it will not be altogether without advantage, if you compare with the observations, which are written in this and the former letter, on the one hand, the greater part of the symptoms recounted by Albertini, and on the other hand, those which are generally given by physicians, in order to distinguish the inflammation of the intestines. Albertini had observ'd the pulse to be low, and rather weak, such as you will find it to have been, in general, in the foregoing letter, under number nine, eleven, eighteen, and twenty-five, and in this, under number two, to say nothing of the asphuxia, which was at last observ'd in the same case, and under number fourteen, and sixteen. He had also observ'd the abdomen to be tense and hard; the face and eyes to have something unusual in their appearance:

ance: of which circumstances, you will find what has been observ'd under all the numbers mention'd above, except the eleventh, and sixteenth, where nothing is said upon the subject.

Medical writers, indeed, agree in the tension of the abdomen. But they add many other symptoms which prove, beyond a doubt, the intestines to be inflam'd; yet they mean that evident inflammation, which all may easily ascertain, and not this obscure disorder which we now speak of, and which very few suspect. Among these symptoms are, particularly, an acute fever, and a violent pain: without which, however, I have shewn, above (*p*), that this inflammation has existed. Besides, in regard to the fever itself only, I would have you read the observation written by the celebrated Rosa (*q*), and you will find, "that the whole intestinal system was inflam'd, and gangrenous," and yet, "that in the whole course of the disease, not the least increase of celerity in the pulse could be observ'd, nor any febrile motion."

This author, also, describ'd a peculiar case, in the year 1745. But before this; not before the observations of my preceptors, and mine; the celebrated Simpson had publish'd those things, which gave the illustrious archiater, Van Swieten (*r*), a proper occasion of commending him, and confirming the opinion in those words, which, although you will see them repeated by more than one of our Italian writers, in the years last past, it will, nevertheless, not be foreign to the purpose to quote on the present occasion: "Simpson has given us a caution, which must prove very salutary, and useful, in the practice of medicine, and tend to prevent those practitioners from being deceiv'd, who suppose that there can be no inflammation, where there is no fever. Whereas an inflammation often produces fix'd pains of the intestines, and stomach, although no fever can be observ'd by the examination of the pulse." You see this very experienc'd man says, that the case happens "often;" so that he does not doubt but this is "a caution, which must prove very salutary, and useful, in the practice of medicine." And this was what I myself, in the year 1703 (*s*), wonder'd should have been omitted, by those physicians that I have at present in my eye, who had taught us the symptoms of inflammation of the intestines, as they had of all other disorders. Thus far then as to fever.

But in respect to pain, it must be added, at present, that it is suppos'd, by the same physicians, to be join'd with a sense of pulsation, and of considerable heat, such as you will find in none of our observations; and you will even read one (*t*), in which, when I expressly enquir'd after a sense of pulsation, and heat, the existence of both one, and the other, was particularly denied. In many, (*u*) you will rather find the pain to be so describ'd by the patients, as if dogs were gnawing them.

By the same writers it is also suppos'd, that there is obstinate costiveness, and continual vomiting, especially if the small intestines are inflam'd, so that the excrements are, at length, discharg'd by the mouth. But you will certainly find nothing of this kind, by reading, over again, what is said above (*x*),

(*p*) No. 20.

(*q*) Aët. p. c. tom. 3. obs. 47.

(*r*) Comment. in Boer. aph. §. 371.

(*s*) N. 14. & 21.

(*t*) Epist. 34. n. 9.

(*u*) Ibid. & n. 18 & 25. & in hac epistola, n. 16.

(*x*) N. 10. 12. 16.

of the servant, the old woman, and the other woman at least: nay, the latter had even a laxity of the intestines. Thirst also you will in vain search for in many: I do not mean that slight thirst which Albertini has sometimes observ'd, but that which they call very troublesome, and which they say is the natural attendant of an acute fever. I omit other things, for it is not my intention to refute writers, whom I greatly esteem; but only to show that those symptoms which are deliver'd as the principal arguments of inflam'd intestines, are not always to be depended upon, as they are not always present, where this inflammation exists.

23. However, I cannot sufficiently, and according to their merits, commend those gentlemen, for admonishing us that the inflammation of these viscera, easily, and frequently, degenerates into gangrene, and sphacelus, and that this may be argu'd from the sudden departure of the pain. Without doubt it is from the same cause, that if this happen in a dysentery, the patients are soon carried off, when they themselves, and those about them, are less apprehensive of it. You have in this third book of the Sepulchretum, and in the eleventh section, an ingenuous confession of Drelincurt (y), which is worthy of Hippocrates himself: for Drelincurt "being rejoic'd" on account of the pains of a dysenteric patient having vanish'd away at once, had reason to repent of his joy three days after, when the patient died without pain, by reason of the viscera being "blasted," or, in other words, sphacelated to a surprizing degree. And when I wrote to you, on another occasion (z), I conjectur'd it to have happen'd from a sphacelus of the intestines, that in the last days of a dysentery, and of life, the fever has even sometimes seem'd to be gone off; and in this (a), and the former letter (b), I have shown what not only the cessation, but the remission also, of these, or other symptoms, when they happen contrary to our expectation, may be suppos'd to be arguments of.

Yet take care how you believe, on the other hand, that in those patients, in whom there is a sphacelus of the intestines, the pains always cease, as you are taught the contrary by the history of the young man (c), who, though he was oblig'd to cry out incessantly, with excruciating pain, for the last fifteen hours of his life, nevertheless had the greatest part of his intestines black, to as great a degree as can be conceiv'd. For the part which yet remains sound, a dreadful inflammation, or some other cause, may, in the mean while, excruciate; as, for instance, a convulsion, or what we observ'd in that young man, and frequently in others, who labour'd under the same disorder (d), I mean intestinal worms.

But whether it happen'd accidentally, or because deprav'd, and irritating, remains of the chyle are the consequents of a depravity in the bile, that others (e), as well as myself (f), have found calculi in the gall-bladders of some of these patients, I leave quite undetermin'd.

However, discharges of black matter by stool, when join'd with a cessation of the pain, as I have taken notice of above (g), are with great justice, and,

(y) In addit. obs. 4.

(z) Epist. 31. n. 26.

(a) N. 14. 16. 18.

(b) N. 15.

(c) Supra n. 14.

(d) Supra n. 16. & epist. 34. n. 9. & 33.

(e) Vid. obs. 47. cit. supra ad n. 22.

(f) Epist. 34. n. 15. & supra n. 16. 18.

(g) Num. iisd.

propriety, plac'd in the number of the most alarming symptoms, and those which show death to be near at hand: and to this we should also add, that which I have describ'd to you in another letter (*b*), not, indeed, as being join'd with a pain in the intestines, which, by reason of their paralysis, had never taken place, but as being join'd with a great inflammation of them all. The next letter you are to expect will be on the subject of tumour and pain of the hypochondria. In the mean while farewell.

LETTER the THIRTY-SIXTH

Treats of Tumour and Pain of the Hypochondria:

FOR those reasons which I have given in the thirty-second letter (*a*), I pass over the very short section, upon the piles, which follows in the Sepulchretum, and come immediately to the two next sections to this, that is to the sixteenth, and seventeenth, and intend to comprehend the arguments of these two sections, which are tumour, and pain, of the hypochondria, in this one letter. For these two affections are frequently join'd together, as it will be easy for you to perceive, from those very observations of Vallalva, with which I begin.

2. A woman of forty years of age, of a yellowish complexion, had long been troubled with a hardness in the right side of her belly, which went down quite to the os ilium, and below it. If you touch'd the tumid part it was painful. She was thirsty. For about a month before her death, she complain'd of a pain in her stomach, after taking food, and breath'd with difficulty. On some of her latter days a vomiting had come on; but on the two last, a very severe and violent pain.

The abdomen was found full of a yellow water, which was bitter in its taste, and, like the serum of the blood, coagulated when on the fire. The stomach was narrow in the middle, so as to resemble the straightness of the pylorus, and, in some measure, to bear the appearance of two stomachs. The liver had grown out into a great bulk. For with its right lobe it reach'd almost to the lower part of the belly. The substance of this lobe was universally indurated, and, in many places, distinguish'd with whitish bodies, some of which, that were the largest, were equal to a filbert in magnitude: when it was cut into, it show'd, in some places, a beginning of erosion, and a putrefaction of the juices to have been at hand. And the left lobe of the liver, being in like manner indurated, press'd upon the stomach in that part,

where I have said it was so much streighten'd. The coats of the gall-bladder were become thick, and the cavity very much streighten'd; and in the cavity, was contain'd a black, thick, and viscid bile. In the abdomen of this body was no appearance of lymphæducts.

In the thorax the lungs were whitish, and variegated with spots of a blackish hue: the left lobe was connected, in some degree, to the back; but the right was every where free. The ventricles of the heart contain'd a fluid blood; yet in the right was the slight beginning of a polypous concretion.

3. In three observations which I have produc'd in other letters (*b*), I have describ'd the stomach to be double, as it were, yet not divided by so great a constriction, as in the present case; though I have taken notice of a constriction, which was still greater than this, from Blasius (*c*), in a man who had been, in every respect, healthy, except his extreme hunger. Nor did I doubt but structures of the stomach, of this kind, had existed from the original formation of the body (*d*): for which reason, I did not search after the cause of these constrictions in the liver, although, in the two first of those observations, it was extended towards the left side, more than it naturally is, but not hard, especially as in the third, the liver was within its natural bounds: nor indeed in the last-mention'd observation, did I account for the vomitings, and pains of the stomach, from that constriction in particular, as they had not been observ'd in the two former.

Yet here I shall ascribe the same symptoms to the greatness of that constriction, inasmuch as it seems to have been more and more increas'd, contrary to what generally happens in the latter part of the disease, from the hardness of the liver increasing every day, and compressing that part of the stomach in particular. For not only reason, but manifold observation, confirms how much the functions of the stomach are disturb'd, when this viscus is compress'd, and depress'd, by the increas'd bulk of the liver: as you will see from the observation of Bartholin (*e*), on a girl of six years of age; and of Fantonus the father (*f*), on a priest, the latter of which had the bulk of the liver so much increas'd as to fill "the whole epigastrium," and the former, so as to occupy almost "the whole abdomen." It is true the liver, when not at all morbid, stretches its thinner part, sometimes, quite to the spleen, as I have taken notice in a former work (*g*): but when it is diseas'd, it has, sometimes, scarcely any bounds to its extension through the belly. Neither of which circumstances ought to be unknown to physicians, and surgeons, lest they should be deceiv'd, in some cases, by that appearance which is common.

Where the liver is found there is room only for suspicion; as for instance, if a wound, by chance receiv'd upon the left hyochondrium, be attended with symptoms different from those, which generally attend the wounds of the viscera, that every body knows to be plac'd there. But when signs of a diseas'd liver are not wanting, as in the woman we are speaking of, the yellowish complexion, and hardness, beginning from the right hypochondrium,

(*b*) Epist. 16. n. 38. epist. 26. n. 31. epist. 30. n. 7.

(*c*) Ibid. n. 8.

(*d*) Epist. 26. n. 32.

(*e*) Sepulchr. 1. hoc. sect. 1. obs. 4.

(*f*) Obs. anat. med. 24.

(*g*) Advers. 2. animad. 2.

it will be less difficult, in such a case, to ascertain the extension of the liver to that part, to which the same continued hardness extends itself.

But whether in the other woman, whose history follows, the continuation of the pain, if you press'd the part with your hand, went so far as to prove the same thing, may better be conjectured by us, than affirm'd; as Valsalva, who was then a young man, and wrote his observations on the living body with great brevity, has not determin'd the question.

4. A woman of sixty years of age complain'd for a long time of a pain above the umbilical region: she had a thirst; she cough'd; and spat up a catarrhus matter. Last of all, she breath'd with difficulty: a few days before her death her belly swell'd suddenly to a great degree; her feet were affected with an oedematous tumour. At length, that pain going off by degrees, she came to the final period of her life.

In the belly was a great quantity of limpid water: but no traces of the lymphatic vessels. The spleen was twice as big as in its natural size. The liver was hard: and the gall-bladder was full of smooth calculi. But in another part of the liver, a congeries of vesicles was seen adhering to it, from which, when lacerated, a serum was discharg'd. And within the substance of the same viscus, towards that part which was turn'd to the diaphragm, was found the cavity of an abscess, which occupied more than a third part of the liver. The matter of the abscess had burst forth into the cavity of the thorax, on the right side, which was universally full of a sanious pus. Yet the lungs were found.

5. As you have been inform'd into what part the abscess of the liver had burst, I do not doubt but you now wish, with me, that all the symptoms which attended a case of this kind, that, perhaps, had never before occur'd to any one, and particularly the latter symptoms, had been collected by Valsalva with more exactness. For Stalpart (*b*), when he wrote of a certain man, in whom pus had pass'd from an abscess of the liver, not plentifully, nor into the cavity of the thorax, but in a small quantity, and into the lungs, through a fistula that perforated the diaphragm, which was become consolidated with both of these viscera, added no example of the same appearances having been seen in dissection, by any other person, contrary to his usual method, and contrary to what might have been expected from his extensive reading. And after him, if we look for observers that are to be depended upon, as we certainly ought, I do not, at present, remember to have read any author, who has met with the same appearance, and still less with the same as Valsalva has describ'd. Who, I suppose, has left in writing all the symptoms he was able to collect. But amongst them you see to what cause the tumour of the belly, and the oedematous swelling of the feet, are to be ascrib'd. And there may be a difficult respiration, from the liver being thus affected, even when the diaphragm is sound; as there may be a cough also, the origin of which was so much the more ambiguous in this woman, as it had an expectation of catarrhus matter join'd with it.

There are extant here in the Sepulchretum (*i*), histories of abscesses in the liver, to the number of twenty. But there is not one of them all, in which

(*b*) Obs. rar. 46. cent. 1.

(*i*) Sect. 17. obs. 2.

a greater care in the observation of the symptoms is not to be desir'd, if you except that of the man of Noremberg (*k*), which is describ'd by Coiterus. But in him a vomica had possess'd the flat surface of the liver, so that it appears to have open'd itself into the cavity of the belly. And on the same flat part, it was in a young man whom Paawius (*l*) dissected; but this had not discharg'd its pus; so that the foramen, "which was big enough to admit two clenched fists," form'd by an "erosion" of the diaphragm, "in that part which lies on the left side of the liver," is not suppos'd to have been form'd by the eruption of the pus: besides, none of the symptoms, which preceded the patient's death, are related, as none are, in like manner, in another case (*m*), wherein the same Paawius found two ulcers in the gibbous part of the liver, which penetrated inwardly.

Nor will you read the peculiar symptoms of the liver being suppurated, in the observation of Blasius (*n*), where the abscess was of such a nature, that the coat of the liver was the only part which separated the pus from the diaphragm, to which the liver was closely connected. And these things I took notice of that you might perceive the more clearly, how very desirable it was that what others had not done, could have been done by Valsalva; I mean in regard to the symptoms, which are, for the most part, common to abscesses of the liver, and which are not yet ascertain'd, or, at least, such as are not in the number of those that Coiterus has remark'd, besides a cough, and a thirst, which Valsalva has also remark'd: and whether those are among the signs of a ruptur'd abscess of the liver, which are pointed out by Coiterus, in the following manner: "the tumour, and hardness," which had been in the right hypochondrium, and the region that lies beneath it, "vanish'd; and the patient being seiz'd, on the same day, with some swoonings, expired." For Valsalva mentions nothing to this purpose, but that the pain, which had been above the umbilical region, "went off gradually," perhaps from the matter of the abscess being carried off, more and more, from thence into the thorax. And what detriment happen'd to the action of the thorax, from this metastasis, he does not so much as hint at; as he, likewise, does not say a word of respiration being made more difficult, nor yet a word of swoonings.

6. If you read over the great number of histories, which were pointed out just now, in the Sepulchretum, you will find that the last-mention'd symptoms have no more been observ'd, in those where a vomica of the liver had discharg'd itself into the cavity of the belly (*o*), than sudden death itself, if you except a man whose case I have mention'd, as being describ'd by Coiterus (*p*): and, on the other hand, you will read that a baker (*q*), whose liver had suppurated, "was sometimes seiz'd with a swooning," though, at the same time, the "membrane of that viscus was untouch'd and sound. Nevertheless, both of these circumstances, which are not to be met with in those histories, has so often occur'd to physicians, and among others, to my preceptor Albertini, that he press'd it very earnestly upon practitioners, not to suffer a patient to

(*k*) §. 6.(*l*) Ibid. §. 7. 8.(*m*) §. 8.(*n*) §. 16.(*o*) §. 2. & 5.(*p*) §. 6.(*q*) §. 14.

be mov'd when there were symptoms of an abscess already form'd in the liver; not because he was ignorant that motion has been prescrib'd, at this time, by authors, who are, in other respects excellent, which I also read has succeeded happily sometimes in our memory; but because he suppos'd, that without using motion, it would, probably, happen, that the pus of an abscess so ruptur'd, without injuring the membrane of the liver, might be carried down to the intestines, through the branches of the biliary duct; and because from a contrary practice, he foresaw how easily the external membrane of the liver might be ruptur'd, so that the pus should be pour'd out into the cavity of the abdomen, and kill the patient instantly, by bringing on a syncope.

For this he remember'd to have happen'd at Bologna, at the time he was a young man, when an excellent physician, and, at the same time, an eminent surgeon, following the practice of those authors, had prescrib'd motion to a virgin who had a suppuration in the liver; by which means the pus being pour'd out into the abdominal cavity, the patient died soon after, in the arms of the women by whom she was supported. And he had afterwards observ'd the same thing to happen, even without motion, at least with a slight motion, such as we naturally use in bed, or while we are rising from bed, in several persons, but particularly in a noble marquis, who had an abscess in the concave part of the liver. And by these observations I was influenc'd to suspect, that almost the same kind of death, in another nobleman (all the symptoms of whose disorder I will write to you accurately at another time (*)) was to be accounted for from almost a similar cause. But he so much the less approv'd of motion, because the abscess is sometimes so large, or of such a kind, that although it may find an exit, by chance, through the biliary ducts, yet the patients cannot be cur'd with that success, which had happen'd to him, in a matron of the first rank, and in like manner in a servant-maid, both of which he assur'd me he had perfectly cur'd, by a long perseverance indeed, but not by any other medicines than turpentine resin, and whey, and afterwards by the juices of ground-ivy, and the consolida media.

For where a vomica of the liver has open'd a passage for itself, through the muscles of the abdomen, two instances of which happen'd at Bologna, although even then, all endeavours were us'd not only by internal, but by external remedies applied to the cavity of the abscess, that the liver might be heal'd, yet they were able to bring about this effect, only in one of the cases: but in the other, in which a matter sometimes was discharg'd, that resembled water wherein fresh meat had been wash'd, and sometimes a yellow humour, they could not obtain the same success; and the patient died at last: notwithstanding in him the tumour had not been open'd so much by the force of nature, as by the error of art. For the physician, although a man of good reputation, and the surgeon with whom he was associated, by no means attending to this, that the jaundice had preceded, and other appearances, in like manner, which show'd the liver to be affected, had suffer'd themselves to be deceiv'd by the touch, perhaps for the same cause, which

(*) Epist. 40. n. 28.

was found by Fantonus the father (*s*), in the extenuation of the abdominal muscles, so as to imagine the tumour, which was actually in the liver, to be in these muscles; for which reason, by applying emollient cataplasms, they had, with a mistaken diligence, brought on a suppuration.

You see what it is I disapprove. For I am not one of those who hold that where nature, itself, urges the suppurated tumour of the liver, to the muscles of the abdomen, the pus should be suffer'd to remain there, for a longer time than is necessary, and by this means be increas'd every day, become more acrid by stagnation, infect the blood, erode still other and other parts of the liver, and open a passage for itself, which would be less expedient, as for instance, into the stomach; for into this cavity was such an abscess found to have burst, by Vogelius (*t*), through a large foramen; and into the thorax, as I have shown above; or, which happens more frequently than either of the foregoing, into the cavity of the belly, from whence a slow and miserable death is brought on, if the immediate danger is avoided, which I have said was seen by Albertini (*u*), and is confirm'd by the illustrious Van Swieten (*x*). His words are, "there is danger lest a swooning, and sudden death, follow, at the time when an abscess of the liver is ruptur'd: for the branches of the vena portarum, that were before press'd upon, by the vomica, being now free from that pressure, by the discharge of the pus, may easily be ruptur'd from the blood rushing into them with impetuosity; especially as they have been macerated, and almost half-eroded, by a very acrid pus having so long lain upon them." Wherefore, agreeably to the opinion of this, and other authors of weight, I would, before these fatal accidents could happen, inform the patient, and the intimate friends, or relations, of the patient, how many and how considerable dangers threaten'd, if a free opening were not given to the pus, as soon as possible: and yet that if this free opening were given, with all that caution which the case requires, a recovery was not always, but sometimes only, to be expected, and that this was signified by the aphorisms of Hippocrates (*y*); and even that those abscesses of the liver also had been more than once heal'd, from which when open'd, far different humours were discharg'd, from what Hippocrates had wish'd: to which kind of instances you will also add that, although the cure was long, and difficult, which is describ'd by the celebrated Jo. Peter Albrechtus (*z*)

But now to come back from this digression, let us go on, from the consideration of those symptoms, which Valsalva has not taken notice of in the history of this woman, to the consideration of those that he has remark'd.

7. Do not suppose that the congeries of vesicles, adhering to the liver, and when lacerated discharging serum, was any thing else but hydatids, as he himself has expressly said, in a separate paper, that they were such as are frequently found to adhere to the morbid liver, externally. And you may with propriety suppose, that the quantity of limpid water, which was found extravasated in the belly, was the effect of many, and without doubt, of the larger vesicles being burst asunder, by the quantity of serum, with which

(*s*) Obs. anat. med. 13.

(*t*) Aët. n. c. tom. 5. obs. 90.

(*u*) N. 4.

(*x*) Comment. in Boerh. aphor. §. 939.

(*y*) 44. & 45. f. 7.

(*z*) Eph. n. c. dec. 3. a. 5. obs. 22.

they were turgid, or, at least, in some measure. I, therefore, would not have you suppose, that these were of the same nature, of which those peculiar vesicles were, fill'd with a yellow humour, that you will read the description of, from the observation of Valsalva, in the third of the *Epistole Anatomice* (a).

But I shall not repeat those histories here, notwithstanding they all relate to disorders of the liver, and some to abscesses of it, as I am determin'd to pursue my original method, which is to avoid that negligence, in consequence whereof, you will find that a great number of repetitions have been admitted into these sixteenth and seventeenth sections of the *Sepulchretum*. For to omit taking notice that in the former section the twelfth and eighteenth observations are the same, in the latter those are certainly the same, which are pointed out in the second observation, under article the tenth, and the twentieth, and in like manner, the fourth observation, and article the fourth of the eleventh, and that which is in the following eighth article, and that under number two, article fifteen, and under the same number eleven, the articles two, and six; to say nothing of the same, which are repeated *totidem verbis* in the scholia to the sixteenth, and eighteenth observations. But without repeating what I then wrote, I shall add only three things to those histories of Valsalva.

8. And first, to that which is given there under number eight, it is proper I should adhere to what it was not necessary to add in that place: I mean that the serum, with which the belly overflow'd, emitted a particular kind of halitus, which smell'd like what often proceeds from persons in fevers, and indeed frequently from their urine: but that when put on the fire, in a short time it became so turbid, instead of continuing limpid, as to resemble cow's whey not well depurated: and, at length, that by the force of the fire it was wholly dissipated. Nor should this circumstance be omitted, that about the lumbar glands, some slight traces of the lymphatic vessels, which were much emptied, had discover'd themselves.

9. But to the next history which I have subjoin'd to that (b), nothing remains to be added to make it compleat, according to the observation of Valsalva, after having sufficiently describ'd it to you in a former letter (c). You will perhaps rather expect from me, that as the vesicles describ'd in that history, were contain'd within a very large one, as within a purse, I should defend the opinion of Valsalva against many authors, the number of whom I see is much increas'd, within these few years, in particular, and who give it as their opinion, that the vesicles found in encysted tumours, which sometimes occur in the liver, and the other viscera, do by no means relate to the glandular follicles being enlarg'd. But I have no disposition, nor indeed is there any necessity, to fall into that dispute again, since the opinion of Valsalva did not depend upon that history only, nor upon any observation of vesicles whatever.

You may even see that Vallisneri, who, in like manner, long before them, saw bladders, or cysts, pregnant with other smaller bags, or vesicles, did

(a) N. 8. 9. 10.

(b) N. 9.

(c) XXI. n. 55.

not, in that very writing which I then refer'd to, take any vesicles whatever, for glandular follicles dilated. Nor did Valsalva find vesicles only in encysted tumours of the liver, for in that history, certainly, which I have just now compleated to you, he had found the whole liver made up of vesicles: although even in those cystic tumours of the same viscus, it is not put beyond all doubt, that the included vesicles can by no means relate to glandular follicles. And what if vesicles not unlike these, have sometimes appear'd in external encysted tumours? Do they, as they are external parts, for that reason want glandular follicles? But, as I have already said, I would not wish again to enter into these disputations.

10. It is much better to attend to this circumstance, likewise, in the last of those histories of Valsalva (*d*), which Malpighi expressly commended in it; I mean the biliary duct communicating with the abscess of the liver, by a large orifice, and dilated in the remaining part universally, so that it manifestly appear'd how this duct might take up the vesicles from the cavity of the abscess, and transmit them quite to the duodenum. For which reason we have the less occasion to doubt, whether this duct does not frequently transmit, through its corroded branches, blood, and pus, which it has receiv'd from vomicae of the liver, down to the intestines, in the manner that is taken notice of above (*e*); and as the biliary ducts being much enlarg'd, having the orifice, by which the bile flows into the duodenum, big enough to admit a little finger, with great ease, evidently confirm'd, in a certain girl (*f*), who having, at different times, discharg'd many pounds of pus by stool, had a great quantity of the same purulent matter in many abscesses of the liver, in those ducts, and in that intestine.

These things then being granted, and as we have frequent, and evident, examples of a similar circumstance in the kidneys, from whence the ureters transfer pus and blood to the liver, I cannot help being surpriz'd, that some very learned men should, nevertheless, sometimes seem so far forgetful of this open passage from the liver, as to assert that the mesenteric veins "often produce purulent diarrhoeas, and carry out the corrupted substance of the liver," as if these vessels convey'd humours, from the liver, to the intestines, and not from the intestines to the liver; and that others hold it impossible to conceive, how a person could vomit blood, and discharge it by stool, without any mark of injury in the stomach, when, at the same time, they are not ignorant that in each lobe of his liver, which was very much enlarg'd, a considerable abscess was found.

But let us return to the observations of Valsalva, which I have not yet publish'd; and to those two relating to the liver, which I have describ'd above, let me add as many which relate to the spleen.

11. A young man of about twenty years of age, having, from an original strength, and firmness of constitution, degenerated into the state of a Valetudinarian, for two years past, attributed this change in his health to hunting, and dancing, and to other things of that kind, which he had indulg'd himself greatly in the practice of, and to the effect of the business by which

(*d*) N. 10.

(*e*) N. 6.

(*f*) Eph. n. c. dec. 3. a. 4. obs. 73.

he earn'd his livelihood; for he was by trade a flax-dresser. He was become pallid in his countenance, and complain'd, according to the custom of hypochondriac persons, of slight disorders of the belly, and thorax, which recur'd now and then. At length, in the summer of the year 1688, a large and hard tumour discover'd itself in the left hypochondrium, with a sense of weight, and a difficulty of respiration in walking. To these symptoms was, suddenly, added a large vomiting of blood, with a great loss of strength, an increase of tumour, and a fever. By the assistance of remedies he was freed, on the first days, from the vomiting, and after that from the fever; and having us'd chalybeates for the three succeeding months, the hardness of the tumour was also remov'd: yet it continued equally large, with a pallid, and, as it were, almost citron colour of the countenance.

But in the month of January, the vomiting of blood returning two or three times, he was seiz'd with a violent fever, attended with a hard and quick, though at the same time small pulse, a pain, weight, and tension, of both the hypochondria, and an inextinguishable thirst. However, on the ninth, or eleventh day, of the fever, he was taken off by a very placid kind of death.

The body being dissected, it was amazing what a small quantity of blood remain'd in all the vessels. And, for this reason, the viscera of the belly attracted the eyes by an unusual paleness, and almost whiteness, except the spleen which preserv'd its natural colour; but this viscus was so much increas'd, as to exceed the liver in bulk, and weigh four pounds and a half. Yet it was not harder than it generally is, except that on its convex surface, in one or two places, was contain'd, deep within its surface, a substance of a very solid nature, of the bigness of a large nut. In the trunk of the splenic vein, polypous concretions lay hid, which divided themselves, together with the branches of that vein, in a very elegant manner, even within the spleen. The liver was very pale, except that here and there it was mark'd with black spots. The gall-bladder, which was more pale than the liver, and even whitish, contain'd a little bile of a very dilute colour, a similar bile to which was not wanting in the fundus of the stomach. The other parts of the belly were found.

In the thorax the lungs on their anterior surface were pale; but on the back-part they appear'd inflam'd, and were of a black colour, inclining to purple: but, when cut into, they discharg'd a great quantity of frothy serum. In the right ventricle of the heart was only a small polypous concretion; and in the left only a beginning thereof.

12. A great number of remarks might be made upon this history. But a regard must be had to brevity, and therefore many things must remain undiscuss'd. The large, and frequently-repeated, vomiting of blood in this young man would have been easily accounted for, at the time when it was not doubted, but any thing might be sent from the spleen into the stomach, by the vein which is call'd *vas breve*. But after that the circulation of the blood, and experiments, have taught differently, the circumstance requires quite a different explication; as, for instance, if we say, that in proportion as less blood can be brought by the *cæliac artery* into the obstructed spleen, so much the more must be carried through the other branches of the same artery to the stomach, or that the return of the blood from the stomach,

through the *vas breve* is impeded by the tumefaction of the spleen, which frequently, and greatly compresses this vessel, betwixt itself and the dilated stomach; so that by one or the other of these hypotheses, or any other of a similar kind, it may be understood, how the blood can open an exit for itself, from the over-dilated vessels, into the cavity of the stomach, which is already particularly dispos'd to such a rupture.

Nor will it I suppose seem to be any objection with you, that the stomach of this young man has been said to be found; for you will imagine that the blood had been discharg'd by a great number of orifices, that were very small, into this viscus, which was probably furnish'd with very lax fibres.

But if you examine the ancients themselves, or those who continued for some time to be their sectaries, and look into the dissections made by them, and collected in the *Sepulchretum* (*g*), of such patients as had labour'd under a disorder of the spleen, and a vomiting of blood at the same time, you will find only one (*h*), which shows any vessel to have been found manifestly open in the stomach. This was written by Riolanus, in the second book of his *Anthropographia* there pointed out, yet not in the fifteenth chapter, but in the seventeenth, and about the end. To whom I shall readily give credit in the affair, but as I just now explain'd it, in regard to the *vas breve*, which was dilated to the thickness of a little finger: I will also believe, if you please, that he found the same vessel open'd into the stomach; although I see that he is there much dispos'd to magnify those things which confirm his own opinion.

For I omit that, when speaking of him, who, as you have it in the fifth book of the *Epidemics*, was suffocated by a vomiting of blood, and saying "that a great quantity of blood had come forth at the spleen and downwards," he adds nothing in relation to the proper interpretation of these words; as if he chose rather they should be so understood, as to relate to the discharge of blood within the belly, (which the very ancient author of that book could not have seen, as it was not usual then to dissect human bodies) rather than to very red spots in the skin, appearing, according to the interpretation of Vallesius (*i*), in the region of the spleen, and beneath it. I therefore omit this. But I can by no means pass by his saying, that in the body of cardinal Cibo, who died after the same kind of vomiting, "Valverda had remark'd (in the fifth chapter of the sixth book) that by compressing the spleen, the stomach was fill'd with blood, which was carried thither by the *vas breve*."

For Columbus, who had dissected the body, has not hinted any-thing of this experiment, as he has said nothing more of the dissection, than what is read in the *Sepulchretum* (*k*): and Valverdes, who has spoken of it, has made use of such words, that you cannot properly understand, whether the stomach "was turgid with blood" internally, or externally, when the spleen was compress'd; and indeed Sanctorius, who had inspected both of the authors, understood them so as to write what you will see in the scholium, sub-

(*g*) L. 3. f. 8. obs. 71. & seq.

(*h*) Obs. 73.

(*i*) Comment. in eum locum, n. 37.

(*k*) Obs. cit. 73. §. 2.

join'd to that observation of Columbus: "while the region of the spleen was compress'd, the blood regurgitated to the orifice of the stomach."

Yet many bodies, although they were dissected after very great, and fatal, vomitings of a bloody humour, or even of blood itself, have shown no sign of an open, or eroded, vessel in the stomach; and even the *vas breve*, notwithstanding the spleen was much bigger than in its natural size, was extremely small, and the roots of it, though they reach'd to the external coats of the stomach indeed, yet scarcely reach'd to the internal: observations of which kind you may find even in the *Sepulchretum* (*l*).

Wherefore, the blood is either brought from the intestines, into which it had burst, or through the biliary vessels, from the liver, which the celebrated Van Swieten (*m*) thought to be the more probable; as, having examin'd with great care all the viscera of the belly in the body of a person who died of a disorder of this kind, he could no where find any appearance of a ruptur'd vessel, nor any considerable injury of any kind.

Indeed, there is also extant an observation of the celebrated Budæus (*n*), which I have already pointed out, in a woman, in whom, after having vomited a great quantity of matter, similar to grumous and corrupted blood, although she had the *vas breve* full of the same kind of matter, and almost equal to a finger in thickness, yet the substance of the stomach was without any conspicuous veins, and the gall-bladder was enlarg'd, and turgid with the same matter, so that it was easy to perceive, from whence this matter had come into the stomach, which even then contain'd a large quantity.

But I would not have you suppose from hence, that it is my opinion blood can never burst into the stomach, from the *vas breve*, in consequence of the direction of the blood being preternaturally chang'd for a time. For it does not escape me what Georg. Wolffg. Wedelius (*o*) has said was found in a matron, after a vomiting of blood; what Jo. Dan. Dolæus (*p*) in a girl; what Stangius and Hillerus, jointly, according to Hoffmann (*q*), in a young man: the last of which observations, I have taken notice of to you elsewhere: and the two first I imagine are the same that I remember to have read in Stahl (*r*). In each of these bodies the spleen was either larger, or harder, than it naturally is: the *vas breve* was also either thicker, or in part turgid with blood, or at least conspicuous by its black colour, in the inside of the stomach, and had its branches there ruptur'd, or some one of them so far pervious into the stomach as to admit a probe by that passage, or flatus, or even blood, when this vessel was gently compress'd.

Yet although any person, who is not ignorant how easily either a probe, or flatus, or impell'd humours, may open to themselves a passage, after death, through the lax coats of the distended branches of the vessels, which was not before open, will perhaps be in some doubt as to these observations; yet you are at liberty, for me, to admit of them, so you do but remember that they were few, when compar'd with the others: and that we cannot,

(*l*) In addit. ad. cit. sect. 8. obf. 11. & 13.

(*m*) Comment. in Boer. aph. §. 950.

(*n*) Eph. n. c. cent. 1. & 2. obf. 105.

(*o*) Earund. dec. 1. a. 9. obf. 20.

(*p*) Earund. dec. 3. a. 5. & 6. obf. 257.

(*q*) Medic. rat. t. 4. p. 2. f. 1. c. 3. obf. 2.

(*r*) Dissert. de vena port. porta malor. f. 3.

therefore, readily assent with Wedelius (s), "that a bloody vomiting most frequently arises from a preternatural opening of the *vas breve*." And although he should answer in regard to every one, according to what he observ'd in a young student, that the vomiting of blood returns, chiefly, at the time when the patient lies on his right side, and that therefore it was necessary for him to lie on the left side, as he had order'd; would it from thence follow that the blood came forth from the *vas breve*, as if no other vessels besides this went to the left side of the stomach?

But whether these, or any other passages, for the blood, evidently lie open into the stomach, at that time, or, which is generally the case, no passages at all are open'd; for you will even read in the commentaries of the famous Academy of Petersburg (t), of a man who was carried off by a sudden death, whose stomach was found quite full of coagulated blood, and yet "perfectly sound," whereas "in the spleen, on the contrary, were found evident marks of putrefaction;" whether, therefore, passages through which the blood has been discharg'd, do, or do not, manifestly appear, you will always explain, after some of the methods which have been hinted at by me, or by others, or at least after some similar method, not only the observations that I have taken notice of, but also those which occur in this sixteenth section of the *Sepulchretum* (u), of the spleen having become more than once tumid, but decreasing after a very large vomiting of bloody serum, or blood; and to these you may add that which Jo. Maurice Hoffmann (x) has publish'd, from the papers of his father: although where it is not well-ascertain'd by dissection, what part is diseas'd, or what part is sound, the fault may be unjustly attributed to the spleen, which ought to be thrown upon some other part that is near it, or even upon the stomach itself.

13. You may enquire here, why therefore in the young man in question, whose spleen, without doubt, was not free from disease, not only this viscus had not its tumour diminish'd by a large vomiting of blood, but even increas'd? To which may be answer'd, that a great loss of strength through the whole body, from a violent profusion of blood, being added to the great laxity of this viscus, which was already become very infirm, the blood could not be propell'd, and carried through it, but with great difficulty, especially as it was become more inert from this profusion; and that therefore it was under a necessity of stagnating more in the spleen, by which that viscus became more and more relax'd. But it may seem much more surprizing, as the vomiting of blood return'd two or three times, in the latter end of the disease, how so violent a fever could follow these vomitings, and be attended with those signs which seem'd to signify some inflammation in the hypochondria, of which, perhaps, these red spots, distinguishing the liver here and there, were tokens.

For the blood which remain'd in all the vessels, was in so small a quantity, and had such an inertia as you would naturally suppose to be the consequence of those hæmorrhages, as the dissection demonstrates. And not

(s) Obf. 20. cit.

(t) Tom. 1.

(u) In schol. ad obf. 13 & 14.

(x) Eph. n. c. cent. 9. & 10. in append. n.

1. obf. 6.

to speak of the appearance itself, the small quantity of blood was argued from the paleness, and almost whiteness of the viscera, and at the same time the inertia, especially when considered in conjunction with the small quantity of bile, which was of a colour extremely dilute. In the bodies of cachectic persons, I have often observ'd the cortex cerebri to be very pallid, and the medulla to be much whiter than usual, in consequence of the sanguiferous vessels, which go thereto, being some empty, and some semipellucid, and for that reason scarcely at all obstructing the enquiry of the eye, that should endeavour to discover, by looking externally, the parts whence the small roots of the nerves go out from the trunk of the medulla, so that I have sometimes much wish'd for brains of this kind, either in order to see these parts the more easily, or to demonstrate them. However, whether the small quantity of bile, and the very dilute colour of it, signified that the more acrid particles were contain'd in the blood, you may of yourself determine. In the mean while, I will enquire what that was, or rather what that was not, which the spleen of this young man contain'd, deep within its substance, in one or two places, of a more solid nature, and of the bigness of a large nut.

14. You have in one of the two sections of the Sepulchretum, which I first mention'd, that is in the seventeenth, an observation (y) of the spleen containing, within its substance, a steatoma consisting of an "adipose matter, " and of the bigness of a nut." You have, in the same section, many observations of the spleen being become in part cartilaginous, or in part bony, or even, as Pechlinus (z) asserts, stony; to which you may join other observations, not only from the preceding section (a), but also from the first of the former book (b). But I believe that induration, which was found in this young man by Valsalva, was of neither kind; for either of them would have been easily known: and he himself, when he had found in the old woman, of whom I spoke to you in the twentieth letter (c), a bone within the external part of the spleen, did not in the least hesitate to affirm, that he had found a certain bony body of a spherical figure. I should therefore imagine that it was of some other kind, or if it was of either kind that I have spoken of, I should suppose it was of the second, that is the beginning of a bony or stony concretion, rather than of the first.

For this is much the more frequent in the spleen, not only as a great number of observations, pointed out in the Sepulchretum, show, but as others also, which are scatter'd up and down, in anatomical writers, and are easily to be found, confirm. Wherefore, you will find a great number, in like manner, in my letters which I have already sent (d), or which I shall send hereafter. However, I would not deny but this has been more frequently observ'd in old men, than in young, and likewise in the coat of that viscus, rather than within the substance of it. For in the coat, or at least on the external surface, after those who first observ'd these appearances, as

(y) 17.

(z) In additam. obs. 2.

(a) In addit. obs. 1. & schol.

(b) In addit. obs. 31. & schol.

(c) N. 41.

(d) Epist. 7. n. 9. & 11. epist. 10. n. 19. epist. 24. n. 18.

Andernacus (*e*), Vesalius (*f*), and Columbus (*g*), they have continued chiefly to be seen.

Yet this appearance has even been seen, sometimes, in young men, as by the celebrated Fantonus (*b*), and by myself (*i*): nor are observations wanting, which show it to have existed within the coat likewise. For Carolus Stephanus (*k*) formerly admonish'd, that it was necessary to cut deep into the substance of the spleen, "that we may see whether there are any calculi in its substance, as they sometimes have been found;" and you will read here in the Sepulchretum (*l*), that a stone, of the bigness of a chefnut, "had been found in the spleen of a beautiful young woman:" and in the eighteenth section (*m*), that the spleen, which was immoderately enlarg'd, "was full of very white stones;" and in another (*n*), "that it contain'd many stones;" to omit mentioning others taken notice of by Lentilius (*o*), and among these, "two pretty large stones, besides many others which accompanied them:" and I myself will, on another occasion, describe to you a case, in which I found a bony body going inwards, from the coat of the spleen, that was also bony; and to this class I should likewise suppose, that, which I just now said was seen by Valsalva, in the old woman, was to be refer'd. And what will you say to this, that Littre (*p*) shew'd to the Royal Academy of Sciences at Paris, not only the "external membrane," as some write, but the whole spleen of a certain old man become bony: and in the Musæum of this university, we have another, taken out of a body which was publicly dissected in the college, before the beginning of the present century.

15. And as this spleen has hitherto been describ'd by no body, I hope it will not be disagreeable to you, if I give you the account of it. As I have, by the consent of the celebrated Vallisneri the younger, who is governor of the Musæum, diligently examin'd it, as far as could be done externally. It is seven inches long, and four inches broad, in its broadest part, and at one extremity more than two inches broad; for with the other it terminates in an angle: in one place it is as thick as the little finger, in other places less by one half, and in many places, but especially at the borders, much thinner. It is of an irregular figure, and curv'd longitudinally: of an unequal and tuberos surface, yet more so on its concave, than on its convex part. Almost every where about the edges are to be seen the dried remains of the membranous coat: these remaining parts go from thence to each surface, but most evidently to the hollow surface, which is still evidently invested with its membrane, and for that reason appears of a yellow colour inclining very much to a brown; but the convex surface is of a yellow colour inclining to white, if you except some places in which the membrane remains, just as it does on the hollow surface. And it is probable that when they pull'd away the spleen from the diaphragm, to which it adher'd very closely, they tore the membrane away from the convex

(*e*) Apud. Bauhin. theatr. anat. l. 1. c. 43.
in adnot.

(*f*) De fabr. corp. hum. l. 5. c. 9.

(*g*) De re anat. l. 15.

(*b*) De obs. med. anat. ep. 8. n. 10.

(*i*) Epist. 24. n. 18.

(*k*) De dissect. part. corp. hum: l. 3. c. 40.
ubi de liene.

(*l*) Sect. 16. obs. 20.

(*m*) Obs. 22.

(*n*) Obs. 25. §. 9.

(*o*) Eph. n. c. dec. 2. a. 7. obs. 136.

(*p*) Hist. de l'acad. r. des sc. a. 1700. observ.
anat. 7.

surface of that viscus, so as to leave it almost universally fix'd to the diaphragm, and in some places even universally, and at the same time, some lamellæ of the indurated spleen which coher'd to the membrane in those parts; and it is probable that from hence was the origin of certain oblong hiatusses, and foramina, of which there is scarcely any on the hollow surface, as there is not the least trace of those places through which the vessels formerly enter'd.

If you look at these hiatusses, you perceive that this spleen is not every where solid; you even see that it is cavernous, and empty, in many places; so that it is not at all surprizing, it should weigh no more than ten drachms: although that stone, which I mention'd just now (*q*), as being found in the spleen, of the bigness of a chesnut, was "of the weight of two ounces and a half, and one drachm." For this was made up of laminæ, like egg-shells, wrap'd over one another, "in the form of a crust;" so that no empty spaces were interpos'd, as in this Paduan spleen, and perhaps also in that Parisian spleen, the weight of which we know to have been an ounce and a half, but are ignorant of the dimensions.

It is also known, in what kind of man this spleen was found, that is in a man who had not been subject to disorders, which are suppos'd to have a reference to the spleen; and of what substance it seem'd to consist, that is of a stony substance. But in regard to ours the latter circumstance is doubtful; and the former, as I have heard from the son of my predecessor, who had been present at the dissection, was quite different. For the body, from whence it was taken, was that of a porter, and not an old man, who had not only been weaken'd by dreadful and incurable pains in the region of the spleen, but had even been oblig'd thereby to enter into this hospital, where he died.

But in regard to the substance of this spleen, although Vallisneri the elder, to whom it had been last given, wrote upon it, with his own hand, these words *milza osseffatta d'uomo*, that is to say, "the spleen of a man ossified:" and although some small parts of it, which are protuberant on the hollow surface, seem to be bony, yet when you inspect the other surface, you will certainly think that it would have been more proper, if he had made use of the same word here also, which he often made use of in regard to the brain of an ox, which was suppos'd to be stony (*r*), and had written *osseolapideous* upon it, which I take for granted he would have done, if he could have bestow'd as much time and labour upon this, as he bestow'd upon that. But it might be more easy for Lanzonus (*s*) to determine upon a similar appearance; for he having found in a blacksmith, who was five and fifty years of age, of a melancholic temper, and who died of a quartan fever, among other marks of disease, the spleen so hard that it did not yield to the knife, but when "struck with the hammer, flew asunder into three separate parts like a stone;" did not in the least hesitate to pronounce that it was "petrified."

16. And, indeed, I have often before inspected, and now particularly, whilst I write these things to you, I have under inspection, a membrane of four

(*q*) N. 14.

(*r*) Consideraz. int. al. creduto cervello di bue impietra.

(*s*) Eph. n. c. cent. 9. obs. 7.

inches in length, and two inches in breadth, which was taken from the convex surface of a human spleen in my presence, and by my order. This seems to be almost wholly converted into flat and thin laminæ, which whether you consider them on the external, or the internal surface, you immediately perceive to be entirely bony, without the least occasion for doubt. But betwixt them, and, in part, out of them, grow small tubercles externally; but internally larger tubercles lie upon them, of an unequal and granulated surface, which went down within the substance of the spleen to the depth of half an inch: and these seem to be a kind of excrescences, as if from a juice of a middle nature betwixt bone, and calculus, which had been effus'd and concreted. Of which ambiguous nature that substance seems to me in great measure to be, from whence the spleen that I have describ'd, from the College Musæum, became indurated. In examining of which, I learn'd that what I had conjectur'd from the membrane, which I just now spoke of, and others, was certainly not always true, though perhaps sometimes; I mean that the conversion of the spleen into a bony, or stony nature, begins in the coat, and, in general, in that part of it which invests the convex surface, and which is, for this reason, subject to the alternate pressure of the diaphragm.

For as often as ever it happen'd to me to see it, in that part, I have seen it, and others have seen it there likewise, or at least all these, nearly, who have said in what particular part, of the investing coat, they found the appearance; for what Pechlinus (*t*) found on the opposite surface, is rare: and to this I suppos'd that the monitum of Boschas is to be refer'd, which is likewise produc'd in the Sepulchretum (*u*), of "the upper coat of the spleen," where it is turn'd towards the muscles of the abdomen, being become so "hard, that it seem'd to be a scirrhus within the substance of the spleen," though without reason: as you will also readily suppose, that what the most excellent Plancus (*x*) remark'd, in a nobleman far advanc'd in age, that is to say an ossification "in the membrane of the spleen," where it adher'd closely to the peritonæum, or that which (*y*) others observ'd in a woman of three and thirty years of age, that is "half the external surface" of the same viscus, "intirely chang'd into a cartilaginous nature," to be of the same kind.

For as to the very skilful Weiffius (*z*) finding the beginning of a change of this kind, that is to say, "a white, tendinous, and hardish substance, upon the back of the spleen, and its middle surface, in an oblique and transverse direction;" or as to an old anonymous author, as you have it in the celebrated Targioni (*a*), having found "so great a hardness of the spleen in two places, where it had adher'd to the ribs, that the part seem'd bony," or at least cartilaginous, but very hard;" you will be in little doubt, I suppose, on determining that these are to be refer'd to the class spoken of above. I therefore conjectur'd that the disorder was, afterwards, propagated from that part of the coat, which covers the convex surface of the spleen, into the remaining parts of the coat, and that by this means the whole spleen

(*t*) Obs. cit. supra. ad n. 14.

(*u*) Sect. hæc 17. obs. 21.

(*x*) Epist. de monstris...

(*y*) In commerc. littr. a. 1734. hebd. 27.

(*z*) Et a. 1740. hebd. 35.

(*a*) Prima raccolta di osservaz. med.

was at length surrounded, as Bauhin (*b*) found it, and, if I rightly understand, Columbus also (*c*), and they in like manner who are here pointed out in the sixteenth observation of the Sepulchretum. And that after this, the indurated matter increasing more and more, and pushing inwardly all round from the coat, compresses the whole substance of the viscus, destroys it, and fills up its place. Yet this, though it may sometimes happen, as I have said, certainly did not happen in the spleen describ'd by me (*d*); since whatever part of its coat remains (and a great part of it does remain) is not only not bony, or stony, but is even, at this very time, of such a nature, that when moisten'd externally; for I have made the experiment in more than one place; itself, only, becomes soon after lost, just as dried membranes are wont to do.

But thus far on this subject. Now let us go on to another observation of Valsalva, which is one of those that relate to the spleen.

17. A woman of eight and twenty years of age, of a slender make, being married, but not having born children, had been formerly troubled with a chronic fever, which had left the spleen so much increas'd in its bulk, that a tumour of this region was very evidently felt: she also kept her palish complexion, and was sometimes taken with a fever, which began with a rigor, and continu'd some days. As she had ceas'd to have a discharge of menstruous blood, for two years past, she soon after was troubled with a cutaneous, but obstinate ulcer, of the left leg: at the side of which ulcer, the leg swelling afterwards, an abscess was form'd. This abscess, although it had been exceedingly well cleans'd, and seem'd to be coming to a cicatrix, yet when the time was at hand that the menstrua should, according to their regular course, have been discharg'd, the ulcer was irritated, increas'd, and emitted a much larger quantity of serous ichor; and on the contrary the farther it was past the time of menstruation, the less was the ulcer irritated, and the less matter was discharg'd. At one of these very times therefore, when, on the preceding day, not only a small quantity of ichor, but such as had a strong smell, had been discharg'd, and no new marks of death being at hand, had come on; behold she was oblig'd, early in the morning, to sit upright in her bed, and, turning herself to one side and to the other, complain'd so much of a streightness of the præcordia, and of a very great anxiety at her chest, that sometimes she could scarcely utter a word, and spat up a great quantity of frothy matter, and matter that was tinctur'd with blood: and thus within an hour she died.

The cavity of the belly was fill'd, almost universally, on the left side with the spleen, which was so much increas'd in its bulk, and especially in the longitudinal direction, that it weigh'd eight pounds and a half. The internal parts, of this viscus, did not seem to differ from their natural constitution: externally, both the sanguiferous, and lymphatic, vessels appear'd enlarg'd, so that the lymphatics were discover'd up and down through the coat of the spleen, and made a very beautiful appearance.

The spermatic vessels contain'd blood of a violet colour; so th you might perceive it had been retain'd there for a considerable time. T at testes were
he

(*b*)

(*c*) Locis supra indicatis ad n. 14.

(*d*) N. 15.

almost

almost wholly scirrhus, so that no body need wonder at the woman's being barren though young. In them was no vesicle, if you except one in the left, which was equal to the half of a filbert, in its magnitude. This adhering very closely to the substance of the testis, and being distinguish'd with sanguiferous vessels, contain'd not a limpid, but a brownish humour: which being let out, a body of a yellow colour came into view, of the bigness of a lentil, and almost of the form, but adhering to the vesicle internally, so as to be scarcely prominent: and this body was surrounded with some very small globules, like a bulwark. And there were in the same testis some other bodies also, which were of the same colour, but not of the same figure, nor furnish'd with the same surrounding bulwark.

As to the thorax, every part therein was sound, except that the lungs were suffus'd with a redness, and when cut into discharg'd a great quantity of matter, of the same kind with that which I have said the woman spat up before her death.

18. Of barrenness from a disorder of the ovaries, and of suffocation, from deprav'd humours suddenly falling upon the lungs, it is not the proper place to treat here; nor yet of married women, who do not bring children, being frequently, at length, liable to some very great disorder; nor of some abscesses in women, which, to all appearance, tend to a cicatrix, and are, nevertheless, frequently very difficult to be brought to it, and for this reason, that when the time returns, in which they are us'd to discharge blood from the uterus, the abscesses, which were already almost heal'd, from the turgescency of the humours, and the motion thereof, which make their impetus upon the whole body, and especially on the weaker parts, open afresh, and enlarge their dimensions, which I remember to have happen'd in the leg of a noble matron, in particular, for many months successively.

As we are, therefore, passing on to the consideration of other things, more suitable to the present occasion, we cannot avoid thinking of those long, and obstinate fevers, which leave an enlargement of the spleen behind them; and of those ulcers of the legs which are the consequence of enlarg'd spleens. And that those ulcers have been, in fact, join'd with such enlargements, even some of the letters, which I have sent to you, have shewn (e). But that the same has been observ'd even from the most ancient times, a passage of the second book of the *Prorrhetica* (f) teaches us: but take care how you read it, as it is quoted here in the *Sepulchretum* (g), in the scholium to the sixteenth observation: "they who have an enlargement of the spleen and hæmorrhages, but "not an ill smell of the breath, will have foul ulcers of the tibia"; for in the Greek the very words are *μητὶς αἱμορραγίας γίνονται*, that is, "nor have a hæmorrhage from any part," as others have more faithfully translated it: therefore this opinion may, in some measure, be accommodated to that woman, who had no eruption of blood from the uterus. And as she was of a slender habit, that would also very well suit with her case, which is immediately subjoin'd in the same scholium, from the observation of Spigelius, "that lean persons are much more liable to tumefactions of the spleen than fat persons."

(e) *Epiſt.* 4. n. 30. *Epiſt.* 12. n. 22.

(g) *ſect.* 16.

(f) *N.* 42.

But that these tumours are the consequences of long-continu'd fevers is demonstrat'd to you by more than one of my letters (*b*), and confirm'd by more than one observation (*i*), in the section of the Sepulchretum. To which you may add the observation of Christian Vater (*k*), made upon a student, who, having been long afflicted with intermitting fevers, had his spleen enlarg'd to the size of a man's head; and, what is remark'd by that excellent anatomical professor Weiffius (*l*), that "whenever" he lit on very large spleens, in the dissection of bodies, he generally found, upon inquiry, that these persons, when living, had labour'd under a violent fever at some time or other, "and that either an intermittent, or a synocha continua:" to omit at present what I have elsewhere taken notice of, from those celebrated men Hoyerus, and Kramerus (*m*), of the infarction of the spleen, after intermittent chronic fevers, and particularly the quartan; whose observations I could wish were not confirm'd by examples amongst us, also, of fevers of that kind, but of such as are badly cur'd. And that such have been observ'd by the ancient physicians also, these words of Hippocrates, or rather of Polybus, are a proof (*n*): "this disease," that is the tumour of the spleen, "happens when from fevers, and bad management of these fevers, bile or "pituita, or both, have fallen upon the spleen." For a viscus which is of itself lax, and cellular, and from which the return of the blood is slow, as it is to pass through the liver, before it enters the vena cava, is extremely liable to tumours, especially if that little share of strength which it has originally, being weaken'd by a disease of long continuance, and the blood being made inert and sluggish, some particles are left therein, which ought either to be corrected, or thrown out of the body.

For the sluggish motion of the blood being increas'd for these reasons, while, like muddy water beside its channel, it is diverted into the cells of the spleen, it of course deposits therein whatever corpuscles it may contain, which are heavier and more gross than the constitution can bear, and by this means, in part obstructing its own return, distends the cells of this viscus more and more. And the more the whole spleen is distended by the distention of the cells, so much the weaker it is, and for that reason more liable to retain, in great measure, those fluids which afterwards flow into it. For which reason it sometimes grows out in an incredible manner, so that Aetius wrote even formerly, that in some persons "the spleen became contiguous to the groin," as you will read in the Scholium just now pointed out; except that as he is there said to have asserted this in the seventh book, and as he compil'd, in all, only four books of medicine collected from the ancients, each of which were divided into four discourses, you must look for it in the third book of the Tetrabiblion, discourse the second, chapter the sixteenth.

This blunder, and that which is still more considerable in the sentence of the Prorrhetica, were transfer'd into the Sepulchretum, by copying the words of Diemerbroeck, and not turning to the authors he has quoted. For he

(*b*) Epist. 16. n. 6. epist. 20. n. 2. 30. 51.
Epist. 31. n. 2.

(*i*) 11. 13. 17.

(*k*) Eph. n. c. dec. 3. a. 9 & 10. obs. 165.

(*l*) Commenc. littr. a. 1745. hebdom. 24. n. 1.
ad 7.

(*m*) Epist. 20. n. 52.

(*n*) De affection. n. 21.

introduc'd afterwards, as I suppose (*o*), examples of very large spleens, insisting upon that which weigh'd three and twenty pounds. But Boschus (*p*), if I understand him properly, had asserted that a spleen had been found, by his own father, which "weigh'd three and thirty pounds." But among the observations that are more modern than these, although I do not remember to have read any, in which the spleen was said to come near to that weight, yet those which were publish'd from Henricus Alb. Nicolai (*q*), and, before, from Maurice Hoffmann (*r*), are by no means to be despis'd. For the latter found the spleen to weigh fifteen pounds, and the former found it still half a pound heavier; and both of them found it so, that the diaphragm, on the left side, was driven to the superior ribs; and Henricus so that, at the same time, the spleen hung down quite to the iliac region.

But Preussius (*s*), in an infant, saw it extended in its magnitude, from the left hypochondrium through the whole side, quite to the pubes: and Vercellonus (*t*) still farther, that is to the lower part of the abdomen; and as it could not go beyond this boundary, it was reflected up again, and terminated behind the uterus, in a mass equal to the size of a fist. It is true, that which was found by Jo. David Mauchartus (*u*), chang'd into the figure of a cone, did not extend itself so far; yet it was large, as, being fix'd to the basis of the diaphragm, it was equal to a large human head in its bigness: in its weight, also, it did not exceed four pounds with as many ounces; but it contain'd that which makes this observation very rare, that is to say, so great a quantity of water within a kind of coat, like a hydatid, I suppose, which had occupied all the internal parts of that viscus, so that Mauchartus did not hesitate to call this disorder "a dropsy of the spleen;" for four pints of water burst forth therefrom.

Thus taking the word empyema in the most extensive signification, you may call that an empyema of the spleen, which was found by Anthony de Haen (*x*), as that viscus occur'd to him "full of pus, which was in great quantity, thick and white;" though by its inflammation it had before been mistaken for a pleurisy.

19. Now before I pass on to other observations, from these of Valsalva's, I am not willing to omit one from him, which will give you to understand, what viscera besides those that naturally lie in the hypochondria, may there create very great and even fatal uneasinesses; especially if to the disorders of these viscera, although slight in appearance, a convulsion be added, which I do not doubt was added in this case.

20. A virgin was seiz'd with a violent vomiting and a fever. The former was appeas'd; but the latter remain'd. A violent pain came on under the false ribs, by which she was carried off within two days.

In the belly was found a very limpid serum. The stomach and the intestines were very turgid from included air. Both of the kidneys were three

(*o*) Anat. l. 1. c. 16. edit. Patav.

(*p*) De facultat. anat. lect. 2.

(*q*) Commerc. litter. a. 1732. hebdom. 33. n. 2.

ad 5.

(*r*) Eph. n. c. dec. 3. a. 9 & 10. in append. §. 958.

n. 1. obs. 5.

(*s*) Earund. cent. 3. obs. 11.

(*t*) Earund. cent. 7. obs. 9.

(*u*) Earund. cent. 9. obs. 41.

(*x*) Apud Swieten comment. in Boerh. aph.

times bigger than their natural size : but the left contain'd, betwixt its proper membrane and the substance which lay beneath it, a little quantity of a famous matter, and particularly on that part which was turn'd towards the spleen.

In the cavity of the thorax was a little water. The lungs were found, except that they were distinguish'd with black spots, which were few in number. The pericardium was full of serum. From the ventricles of the heart flow'd out a pretty fluid blood ; yet in the right, was the beginning of a polypous concretion.

21. The increas'd bulk of the left kidney, and a disorder therein, at the same time, have more than once excited a tumour, or pain, in the hypochondrium of the same side. And this may be learn'd from some histories, which are produc'd in these two sections of the Sepulchretum, as in the sixteenth, that which we have under article the second, of the twenty-second observation, and in the seventeenth section, two which are read under the ninth article of the thirtieth observation, where Ballonius says as follows : " they did not suppose the pain to be nephritic, and yet it was so ; but the " situation of the pain, and of the part, deceiv'd the practitioner." And that this may sometimes happen on the right side also, that history which is given in the same thirtieth observation, in the first place, demonstrates.

But that which is read last in this observation shows that the same thing may happen, not only from the parts which lie below, as the kidneys do, but also by the parts which lie above ; as, for instance, by the septum transversum being overloaded with a quantity of pus, and forc'd downwards : for thus I conjecture that this history ought to be explain'd, rather than by a kind of consent, and affinity ; as from the same septum, when depress'd by the force of water, or a thick serum, I have already shown you (y), that a hardness and pain have been brought on in the upper regions of the belly. But now, not to recede from the kidneys, and from other parts which lie beneath the hypochondria, I think the observation of the celebrated Bonfiglius (z) ought to be added, in reading of which attentively, you will readily perceive that an inveterate tumour, that had been formerly felt in the right hypochondrium, was nothing else but the kidney, which, by being increas'd more and more in its bulk, had at length fallen forwards from its natural situation into the iliac region, where it was found to be five times as big as its natural size.

But in regard to other parts, the celebrated Gœkelius (a) will show you, that from the omentum, having its bulk enlarg'd by a kind of scirrhus fatness, wherein the whole spleen was enwrap'd, there was a tumour of such a kind in the left hypochondrium, and with such a resistance, that, for this reason, the tumour " exactly resembled a scirrhus" of the spleen. And Schrockius (b), Hurterus (c), and Gerbezius (d), remark'd a tumour in the other hypochondrium, together with a pain from a scirrhus, which adher'd very closely to the intestines, ileum and colon ; or from the colon being rais'd into such a bulk, that by forcing itself against the ligaments of the liver, it drove

(y) Epist. 16. n. 26. & epist. 30. n. 30 & 31.

(z) N. c. cent. 9. obs. 4.

(a) N. c. cent. 6. obs. 94. ad n. 7.

(b) Et cent. 1 & 2. obs. 186.

(c) Ibid. obs. 184.

(d) Et dec. 3. a. 7 & 8. obs. 186.

that viscus from its natural situation, towards the left hypochondrium: or a pain only, which had been falsely imputed to the liver; whereas it arose from the mesentery, which was, soon after, found to be "eroded" under that viscus, nearly to the breadth of a span. But let us return to the disorders proper to the viscera which lie in the hypochondria.

22. However, as I have, much the more frequently, describ'd to you observations of the liver or spleen being tumefied, it will, for that reason, be sufficient here, to add to those which I have hitherto produc'd from Val-salva, a few that are common to the tumours of both these viscera.

23. A woolcomber of about forty years of age, came into the hospital of Padua for obstructions, as he himself said, of the hypochondria. And that he said what was true, not only the bad colour of his face, and an infirm state of health for a whole year already, and a slight fever, with which he was often attack'd, and was not free from even at this very time, demonstrated, but the application of the hand to both hypochondria, and chiefly to the right, particularly confirm'd. When he seem'd to have receiv'd some advantage from a course of remedies, behold he was seiz'd with an acute fever, attended with signs of an internal inflammation of the thorax; and by that he was carried off within ten or twelve days.

His body was brought into the college, that I might therefrom begin the anatomical demonstrations of the year 1746: and as I examin'd the carcase, I saw that it had a pretty clear appearance on the skin, and was not altogether lean, nor were the feet cedematous. The muscles of the abdomen being dissected, scarcely at the distance of two days from the patient's death, and that in the month of January, were lax, and at their lower part inclin'd to a greenish colour. Yet the parts which were contain'd in the belly had a natural appearance, if you except the following. The liver was immoderately large; so that the very great magnitude of it immediately struck the eyes of every one: and although it had not a bad colour externally, yet, internally, I observ'd it to be of a palish colour inclining to brown; and, besides this, universally mark'd with certain brown spots, if you examin'd it with a stedfast and attentive eye, either on the inside or the outside; and harder than it generally is, which appear'd not only to the fingers, but was also evident, by cutting into it in several parts, and in several directions. And while I was making these incisions, I also observ'd this circumstance, that no yellow point had appear'd any where with any of the sections of the veins, which is the general mark of the small branches of the hepatic duct being cut transversely, at the same time, whether this happen'd from these vessels having collaps'd in some measure, from the small quantity of bile which was secreted in the liver, or rather because the bile was of a more pale and dilute colour, and less apt to tinge: and indeed, in the cyst was but a small quantity of bile, in proportion to the bulk of the liver; the cyst itself was small, and had thin coats; and the bile inclin'd to a kind of cineritious colour.

The spleen was twice as big as it naturally is in every dimension; but in other respects, as far as I was able to judge, it was not to be found fault with. The splenic artery, from the origin to the termination, contrary to the general appearance, had nothing tortuous in it in any part, nothing vari-

cous, if I may so speak, excepting one place only, about the middle of its length, where it was a little inflected.

On the mesentery had grown a hard body, of the bigness of a small cherry, and almost of the figure, but unequal, and granulated, on its surface, and of a middle nature betwixt bone and stone: at one side of this body was an arterial and venous branch, which ran very close to it, but did not enter the substance, going out from thence to the intestines, which were at about two inches distance from this body. The ileum had that appendix, or diverticulum, if you chuse rather to call it so, which, as I have describ'd it in the thirty-fourth letter (e), it will be sufficient to have slightly taken notice of here. For it will be more to the present purpose, to observe what other appearances I saw in the belly of this man. The external iliac vein, on the left side, near the opening of the internal, was hard, and yet not bony, as the coats were only much thicken'd, in that part, for some little extent: and these coats being laid open, I saw, in the cavity of the vein, on one side, where it was perforated with no orifices, small chords protuberating, and a kind of small valves.

But that deserves our attention still more, which I saw in the kidneys, and in their arteries, though it was rather unusual, than preternatural. These arteries were about nine inches in length, but narrow in proportion to this large extent, except that they were rather wider in the upper extremities. The length of the sinusses, also, that receive and send out the vessels, was unusual; which was the more easy to be taken notice of, as that whole part of the substance of the kidneys was wanting, which should have made up the anterior paries of the sinusses: and for this reason, the larger of those branches, that convey the urine into the pelvis, were quite naked, and expos'd, and the sanguiferous vessels were expos'd in all that part which is generally buried within the sinus. But as two arteries, that is the inferior and the superior, and as many veins went to each kidney, the veins went out from the sinusses in such a manner, that the inferior ascended obliquely into the superior, which was transverse. And the arteries were not join'd with each other, but the inferior, as well as the superior, was carried in a transverse direction, without any obliquity, for which reason the inferior did not go to the sinus, but penetrated the kidney, almost at its lower side, beneath the sinus,

From this description you perceive, that both the inferior arteries must have arisen much lower than the arteries of the kidneys generally do: and indeed they did arise from the aorta, at not more than the distance of an inch above the division into the iliacs; and, what is, perhaps, much more extraordinary, not from the sides of the aorta, but from the very middle of its anterior surface, where they were so near to each other, that their orifices were but just separated, by a very thin septum: coming out from thence, on both sides, similar and equal, and being divided into no branches, before their insertion, they were inserted as I have already describ'd; whereas the superior arteries, which were a little, but not much, thicker than these, dis-

fer'd neither in their origin, nor in their ramification, from those which we generally see.

The inspection of other parts we could not prosecute with the same diligence, as a better body was procur'd in the mean while. For which reason we did touch the head.

In the thorax, finally, we found the right lobe of the lungs annex'd to the pleura, and hard: in the pericardium was a bloody water, to the quantity of some spoonfuls: in the heart, two veins, which ran longitudinally upon its posterior surface, were turgid with blood, and in a manner various.

24. Setting aside the consideration of the appearances which have no affinity to our present subject, if we attend only to those that relate to the tumefied spleen, and to the tumefied and obstructed liver, the splenic artery, if we are to suppose that it was not without inflexions in its original formation, may seem to any one to have lost these tortuous diverticula, while the course of the arterial blood into the hard liver being obstructed, a greater quantity of it was therefore necessarily oblig'd to flow into the splenic artery. And how much, when the liver is obstructed, the small arterial branches within that viscus are compress'd, and how much less a quantity of blood they admit, is not only demonstrated by reason, but sometimes also confirm'd by evident observation. For the celebrated John Baptist Vulpus has affirm'd to me, that he twice happen'd to find the trunk of the hepatic artery so dilated, in a body where the liver was obstructed, that he could introduce his thumb into the cavity.

However, when the liver is thus affected, how easily the constitution degenerates into a cachexy plainly appears in the man we speak of, from that small quantity of discoloured bile, besides other things.

But if a very considerable disease occupy the liver, we learn from a great number of observations, that, frequently, the constitution tends not only to a cachexy, but even to a dropsy. Among which are worthy to be read, those given by the celebrated Rostius (*f*), and Usenbenzius (*g*) either on account of the appearances found in the scirrhus liver, or on account of its weight. And to these you may also add that which I shall immediately subjoin.

25. A porter who seem'd to be of a middle age, and who had never been attack'd with any disease, felt a very considerable uneasiness in his loins immediately after lifting up a heavy load, which then oblig'd him to lie in bed for two days, and made him so weak, for the remaining part of his life, that he could not now lift up even the weight of twenty pounds, without occasioning a pain in his loins. A month after this accident he seem'd to himself to hear the agitation of water in his belly, while he turn'd himself in bed, and soon after to perceive a kind of body, as it were, ascending from the hypogastrium, into the scrobiculus cordis, as it is call'd, which, stopping there, caus'd the beginning of a very hard and pretty large tumour; with which being afflicted, and with a slight fever, at the same time, he came into this hospital, in the fifth month after his lifting that heavy load, and related all these things which I have related to you.

(*f*) Aët. n. c. tom. 2. obs. 178.

(*g*) Et Cent. 9. obs. 27.

It was then certain, that he had a continual, though slight fever, which was exacerbated in the night-time, that there was a tumour in the scrobiculus cordis, and also below the lower ribs, but especially on the right side, and that water was extravasated in the abdominal cavity. In the mean while this extravasation increas'd, so that when I happen'd to have occasion to go up into the hospital, just about a month from the time of his coming into it, and being ask'd to feel the man's belly, I scarcely perceiv'd any particular tumour elsewhere than in the scrobiculus cordis, the abdominal cavity being so greatly distended with water.

This tumour was very hard, and very unequal, but free from pain, even when you press'd upon it. I inquir'd whether it was troublesome by its weight? whether there was any pain which was produc'd quite to the throat? and whether he was ever troubled with a cough? To all which queries the patient answer'd in the negative. But when I ask'd him whether the tumour increas'd at that time? He not only answer'd negatively, but even asserted that it had subsided, and was grown much less; I suppose because it was in great measure obscur'd by the increasing water: and indeed, those who had felt it at other times could not perceive it to be diminish'd. The face of the man was somewhat pale, but not yellow, nor of a cineritious colour; and even the white parts of the eyes, though I examin'd them very attentively, did not appear to me to have the least yellowness.

He lay, for the most part, on his back: though he could lie upon either side. He was thirsty, but not to any great degree. He drew his breath not quite freely, yet not with any great difficulty. Which circumstances I remark'd with the more nicety, as I foresaw that the patient would die in a very short time, and give us the opportunity of examining into the state of his viscera, for which reason I left him with an uncertain, and, in part, a suspended opinion, in regard to the universal seat of the tumour: and the patient, having his pulse, at length, become very small, but preserving his senses perfectly to the very last, died in a very placid manner, as he was speaking to some persons around him, in the beginning of April, in the year 1745, about fourteen days after I had seen him.

But when the body was dissected, as it was on the following day, I was so much taken up with business of importance, that I could not attend. However, our Mediavia presided at the dissection, in my room: from whom I receiv'd this account on the same day.

The body was lean, and no where, unless slightly in the scrotum, and still more slightly in the feet, affected with an cedematous tumour. The belly contain'd a great quantity of extravasated water, not of a disagreeable smell, not thick, nor turbid from a kind of thin membranes, as it were, swimming in it, but pellucid, yet inclining to that colour which we see in oil of almonds. The omentum being drawn up into the left hypochondrium, was found indeed, but of a greenish colour inclining to brown. The stomach was small and contracted. The spleen was twice as big as it naturally is, externally whitish, and internally had some white substances, which, however, were not hard. But the liver was by far the most enlarg'd, so that some of those who were present judg'd it to weigh about fourteen pounds. At least it occupied the whole upper region of the belly, and the part which lay next thereto anteriorly,

riorly, although it did not extend itself much below the ribs: and it had grown out so much towards the left side, that the ligamentum suspensorium, which was in other respects pretty thick, being curv'd very much towards that part, the umbilical fissure was at the left side of the cartilago ensiformis. The whole liver was hard, and distinguish'd, in several places, with protuberating spots, not narrower than a thumb's breadth, and these of a yellow colour; but in other respects this viscus was pallid. These were the appearances externally. And internally, if you except a few portions of the hepatic substance intermix'd here and there, the whole viscus consisted of a substance, which could not more easily be cut asunder, than the mammary gland: this substance was of a white colour, degenerating into yellow, and being press'd seem'd to emit a kind of purulent ichor. Finally, the gall-bladder was exceedingly small.

26. When a black smith, and, in like manner, a woman of whom the celebrated Schmidius speaks (*k*), perceiv'd that something was broken within them, not without a great, or a burning pain in the region of the liver, from exerting themselves in lifting up great burdens, it appear'd that neither of them was deceiv'd from what was found in the body of the smith, and from the circumstances which happen'd to the woman. But what our porter hurt in his loins, in endeavouring to lift that burden, and what it was which had impos'd upon him, so as to appear like a body that was ascending, although you may happen to conjecture properly, yet you cannot easily demonstrate. This, however, is certain, that as the disorder, and tumour, of the liver increas'd, the water was increas'd in the belly, whether you suppose it to have been there before, in any preternatural quantity, or not. For without doubt, the very swelling, and weight, of the liver naturally press'd upon the trunks of the vena-cava and vena portarum, and a great number of lymphæducts, at the same time, while the patient lay continually in a supine posture of body, so that out of some of these being ruptur'd, or if they were found, from the mere stagnation of the blood, more water would be pour'd out into the cavity of the belly.

A cause was also added, which made the blood inert and sluggish, I mean the very great disorder which there was in the liver that was scirrhus; so that a bile was secreted, which was not fit for the purposes to which nature intended it; and this bile was in small quantity also, as the smallness of the cyst confirm'd: for which reason neither good chyle, nor good blood, was prepar'd. To this add, that the spleen was preternaturally increas'd in its bulk, and diseas'd in its internal constitution: for although we cannot well determine, what is the office of this viscus in particular, yet we do not doubt but it is, in general, of use in preparing one or both of these humours. But why in this and the former man, and in so many other examples, among which I could reckon not only that infant spoken of by Preussius (*l*), but also the woman whose history is given by Portius (*m*), if the same thing were not so often seen in dissections; why, I say, the spleen, and the liver, were found tumid, I do not suppose, you will enquire, as you very well remember from whence both these viscera receive their blood.

(*k*) *Commerc. litter. a. 1734. hebdom. 34.*

(*l*) *Obs. cit. supra ad n. 18.*

(*m*) *Act. erud. Lips. a. 1704. m. Septembr. in relat. ejus opusculor.*

For as both of them have their arterial blood from the same cæliac artery, which ever of the two shall first become tumid, and, for that reason, admit a less quantity of blood, must, of consequence, force a greater influx into the other. And as the liver receives its venous blood, in part, from the spleen, which we suppose to be intended for the purposes of secreting the bile, there is no doubt but, if the liver is tumid, a greater quantity of blood will remain in the spleen: but if the spleen be tumid, a blood of such a kind will be sent therefrom, as is very unfit for going through the narrow passages of the liver, and at the same time, very improper for the secretion of a well-condition'd bile; so that if this be secreted in a very viscid, and thick state, it will be in part obstructed in the liver, and will itself, consequently, increase the bulk thereof.

27. These things, however, and some others, which I have advanc'd, in almost the same manner, in this letter, I would have you admit with such limitations, as to suppose that the effects I have mention'd, may be the consequences, if a proper time be given for these causes to act, and there be no impediment to their action; for they do often follow, as I have said just now, but not always. Thus, to illustrate our supposition by examples: Jacobus Sylvius (*n*) dissected a stone-cutter, who had an enlarg'd liver, which was tender, and pale, like a liver that had been boil'd; but his spleen was of a cineritious colour, had two small scirrhi externally, and internally appear'd as if it had been boil'd. Why was it not also enlarg'd? Left you should happen to suppose this to have been owing merely to the tenderness, which, counteracting the effects of the increas'd weight of the liver, still preserv'd an easy passage for the blood, through this viscus; know that there were in this man, which is an extraordinary instance, "three large branches, "that went from the left emulgent vein, to the spleen," through which, as the circulation of the blood now teaches, a great part of the blood, that otherwise must have pass'd with difficulty through the liver, and have distended the spleen, by remaining there, was diverted into the emulgent vein. But whether the same three branches, by carrying away the blood from the spleen, sooner than the nature of that viscus requires, and by depriving the liver of a part of that assistance, which it receives from the spleen, and which is necessary to the full performance of its functions, contributed any thing, in a long course of time, to those disorders which were observ'd in both the viscera, you yourself will judge.

According to those things, which I have just now said, or these that I have now hinted at, it will be easy for you to explain other examples, as that of Riolanus (*o*), and of Fantonus the father (*p*); in which cases, the liver being indurated, and increas'd in its size, the spleen was not only not larger than it generally is, but was found to be so extremely small, that it scarcely weigh'd an ounce, or that the traces of it alone remain'd. For suppose that the spleen was diminish'd, whatever the cause of this might be; and you already perceive, how much more arterial blood must, of course, have been sent to the liver, and how little assistance, therefore, there must have been given to the secretion of good bile.

(*n*) Observ. adject. Isagogi anat.

(*p*) Obs. med. anat. 24.

(*o*) Anthropogr. l. 2. c. 16.

Or suppose, on the other hand, that the liver is increas'd in its bulk, from some cause or other, so as to occupy the whole epigastrium, as in the example of Fantonus, and to thrust the stomach down into the umbilical region: you will then easily conceive, how both the spleen, which is a soft and lax viscus, and the splenic artery, from whence it receives the blood by which it is nourish'd, preserv'd, extended, and dilated to a proper degree, may be at the same time compress'd: and as this artery passes under the pancreas, being affix'd to it longitudinally, you see evidently, how much it must have been press'd upon, in the example given by Riolanus, in which the pancreas was universally scirrhus, and in its bulk, and weight, was equal to the liver itself. For as to his finding remains of the spleen, in another body, of the breadth of a finger-nail, this might, perhaps, have been owing to a greater, and more long-continu'd, compression of the splenic artery, as he there found the pancreas to be not only scirrhus likewise, but even indurated like a cartilage.

28. However, to say nothing of the pancreas, and return to the spleen, and liver, I confess there is so much mutual commerce, and connection, betwixt both these viscera, that if one be diseas'd, in consequence of the other being diseas'd, there is no reason for surprize: but on the contrary there is reason to wonder, if a disorder be found in either of them only, as when you read in the *Sepulchretum* (q): "the liver was large, and in many places hard; . . . the remaining viscera of the belly being in a natural state:" or (r) "the liver was almost without moisture, and pallid; . . . but the spleen, and kidneys, had a natural appearance." Nevertheless, even in a long disorder, where a greater injury is found in the other viscera, than in the liver, it by no means follows, that in this also the disease must have been of long standing: which I would have to be understood chiefly of the second of the observations, just now pointed out.

We must take care, moreover, that we do not, now and then, take some appearances which have existed from the original formation of the body, for the causes, or effects, of diseases: of which kind I should suppose those "several incisions" of the spleen to have been, that are mention'd in this seventeenth section of the *Sepulchretum*, under observation the nineteenth, and which seem to be reckon'd among the morbid appearances, just as I believe of those "chinks or fissures of the liver," which are sometimes produc'd, in the preceding seventeenth section of the *Sepulchretum*, as the causes of a pain in the right hypochondrium." Blunders of this kind are easily refuted, by a frequent and attentive observation of the fissures of both, or of one, or other, of the viscera, which most frequently occur in bodies of every kind, and not without some utility, as I have said in a former work (s).

But, although a reason could not be given for all the cases, in which we read of the sound state of one of these viscera, being join'd with the disorder of the other, these would not be the only instances, which seem to happen sometimes contrary to expectation. For, not to quit the history of the por-

(q) L. 3. f. 14. obs. 36. §. 4.

(s) *Epist. anat.* 1. n. 35.

(r) *Ibid.* obs. 20.

ter, it certainly does not very well appear, why the patient did not feel any uneasiness from the weight of the liver being so much increas'd : nor yet why, among the symptoms which I observ'd to be absent, some, in particular, could be absent, in so great a depravity of the liver. And without doubt, we ought to take warning from hence, not to be too rash and hasty in pronouncing any thing for certain, by denying or affirming in some cases. And indeed some things occur in medicine, which are still more extraordinary, and surprizing, than those I have just now hinted at; and which ought, therefore, to render the physician more cautious, in forming a diagnosis, and consequently in acting.

Two cases of that kind I will, in this place, communicate to you, as I have receiv'd them from others, since they will not be foreign to the present purpose; for they relate to a morbid state of the two viscera, which lie in the left hypochondrium, the spleen, and the stomach. Of the spleen our Mediavia observ'd as follows, in the living body first, and after that in the dead body, about the end of the year 1735.

29. A man of a lean habit, among other disorders on account of which he lay in this hospital, had a tumour also in the left loin, where this begins to terminate in the outer side of the body, under the lowest rib. This tumour sometimes appear'd less, and sometimes bigger, to the eye that examin'd it, yet never was very apparent at any time; but it yielded to the hand that press'd it, as if it contain'd a fluid. At length the man sunk under his diseases.

The belly being open'd, it appear'd evidently from whence this tumour arose. For the lower part of the tumid, and very soft, spleen reaching to that place I have mention'd, and being, at one time more, and at another time less, forc'd thither by the status of the stomach, and intestines, caus'd such an appearance in this body, which, as I have said, was very thin, as might easily have impos'd upon some rash and inconsiderate surgeon, to the great detriment of the patient.

30. In the second book of the predictions (*†*), after many things that are said of those who have large spleens, the following words are immediately subjoin'd: "but if tumours should also come on in the feet, they will even seem to have water. Yet it is necessary to examine the belly and the loins likewise." I would have you see, therefore, among those who have interpreted the oracles of Hippocrates, whether there is any one, by whom the inspection of the loins is refer'd to these enlarg'd spleens, the other symptoms of which immediately precede.

But Peter de Marchettis, whom I have already commended, read to me a case in the year 1730 (from a letter of a neighbouring physician, who was very much esteem'd by each of us) which relates to the stomach: the case was as follows, the circumstances having been all very well-known to the physician who wrote, as they happen'd in the place where he resided.

31. A woman had a tumour form'd at the region of the stomach, which being examin'd by the surgeon, seem'd to him to be coming forwards to sup-

puration; yet after having applied many things proper to hasten the suppuration; he, nevertheless, could not bring it thereto. Finally, this was the issue of the case, that the tumour disappear'd, the skin remaining contracted, where the tumour had been in the form of a cicatrix, notwithstanding it had not discharg'd any moisture. After this the woman conceiv'd, and the time of utero-gestation, of delivery, and child-bed, being happily pass'd over, she being in good health and her milk flowing properly, as in a woman who gave suck, and having now reach'd beyond the third month from the time of her delivery, she of a sudden perceiv'd that a little moisture distill'd from that cicatrix. And on examining the moisture, found that it was the wine which she had just drank. She could also, if she endeavour'd to do it, force out by this way some of the pudding she had taken in. Yet the final event of the disorder was that the wound was perfectly heal'd up, and the woman continu'd to be in good health, as the physician who was interrogated by other letters from Marchetti, which he wrote with great friendliness, in order to satisfy me in regard to the case, assur'd me.

32. You may also read many examples of the stomach being perforated, the foramen either lying hid within the cavity of the belly, or being open'd externally, in the history of a virgin who labour'd under this disease, for seven and twenty years, publish'd by the celebrated Christian Wencker (*u*); and these may be added to the Sepulchretum: for although it was not possible to cure any of these patients, it was possible, however, to dissect them all after death. But you will find a successful case, and not unlike that which I describ'd to you just now, in the programma which Etmuller the son added to his dissertation, intitled "*de prægrandi pedis inflammatione*." And as in this programma you may, at the same time, see every thing that relates to the perfect cure of a stomach thus injur'd, so that nothing shall fall out from thence into the cavity of the belly, I will add nothing farther to this letter, which is already very long, except to entreat you to preserve your usual affection for me, and take care of your health.

(u) Argentorati a. 1743.

LETTER the THIRTY-SEVENTH

Treats of the Jaundice, and of bilious Calculi.

THE morbus regius, or jaundice, so is frequently join'd with the disorders of the liver, of which I particularly wrote to you in the last letter, that in the Sepulchretum, the eighteenth section, which professedly treats of this disease, is with great propriety immediately subjoin'd to the two sections which treat of those disorders. To the jaundice relates this observation of our Valsalva.

2. A young priest was seiz'd with the jaundice, a little after a kind of perturbation of mind: this disorder was also attended with a pain at the region of the stomach, and a vomiting, by means of which he threw up both his food, and his medicines, frequently. After a day or two, the patient was observ'd to be unquiet, and in some measure stupid, so as to forget every-thing that was related to him. The physician did not observe any fever, till the close of the third day: at which time it discover'd itself with great violence, with a delirium, and convulsions of such a nature, that the patient was oblig'd to gnaw every thing with his teeth, and by his great strugglings almost overcame the strength of those who were about him: besides these, he was troubled with a vomiting of a darkish-coloured matter. In the morning a vein was open'd, from whence the blood rush'd forth with impetus: the serum of which, when it receded from the coagulating part, ting'd a linen rag, that was dip'd into it, of a yellow colour. The convulsion ceas'd: but the patient lay to all appearance asleep, scarcely mov'd himself, and did but just show that he felt the cupping-glasses which were applied to him. His respiration was almost natural, except that it was sometimes suspicious. He died on the beginning of the fifth day.

The belly being open'd, the liver was found to be flaccid, and inclining to a palish colour: in the gall-bladder was a darkish bile. In the stomach was matter of the same kind with what he had thrown up, on the last days of his disorder: on its internal coat, about the left orifice, were a kind of red points, at some little distance from each other. And there were many very small glands, in several places throughout the belly, which were inflam'd by stagnating blood.

The thorax being open'd, the lungs were tumid with air, and free from connexion with the pleura, if you except some small membranous bands, which

which had tied the left lobe to the pleura. In the pericardium was a little water. In the ventricles of the heart was concreted blood.

The skull being cut open, and the dura mater being incis'd, a little quantity of serum issued forth: in the interstices of the sanguiferous vessels, which creep through the dura mater, a kind of gelatinous concretion was observ'd, but in a very slight degree: the cerebrum was very lax, nor altogether of its natural colour, which perhaps had been deprav'd by the tincture of the bile. While the spinal marrow was cut through, in the upper part of the vertebral tube, in order to take out the brain, from the external paries of this medulla, a ferous matter flow'd for a considerable time, as if from a lymphæduct being cut through.

3. What effect passions of the mind may have in bringing on a jaundice, is not only demonstrated by frequent observations, in the practice of medicine, but evidently confirm'd by the present. Nor will this be surprizing, to those who consider how much the nerves consent with the passions, and how much power the same nerves have, in affecting the sanguiferous, and excretory vessels, and in affecting the internal secretory organ, whatever that may be, and consequently in impeding, and vitiating, the secretions, and excretions, of the humours. Suppose, that in some bodies the hepatic nerves consent most, or if other nerves consent also, yet that the vessels of the liver, and the secretory organ, yield more easily to the action of the nerves; and you will immediately understand why a jaundice arises in them, from the passions of the mind.

Thus in Hoffmann (*a*), you will read of a woman, in whom, "as often as ever from a preceeding commotion of mind . . . new febrile paroxysms came on, the jaundice immediately return'd with all its symptoms." And if you take into the account, certain dispositions of the blood, or of the matter of the bile, which is to be secreted therefrom, or of the other viscera, you will so much the more easily understand the affair, and conceive of the origin of those very violent symptoms, which are sometimes added to a jaundice, and bring on death much sooner than expected. All which circumstances may not only be perceiv'd, in the observation that I have given you of the priest, but may also be illustrated, by examples that are in great measure similar. The first of which was related to me, when I resided at Bologna, for there it had happen'd, and that not many years before, by grave and learned men, and confirm'd by Valsalva himself, who had been present at the dissection.

4. A very ingenious young man who was set apart for learning, and the priest's office, was greatly terrified by a fierce and violent man, who held a musket to his breast, unexpectedly, and threaten'd to shoot him. The day after he became icteric, and soon after that delirious so as to know none of his acquaintance, but cried out every now and then, oh vile man! and then being seiz'd with very great convulsive agitations, so that he could scarcely be held by the hands of many persons, he died within four and twenty hours from the beginning of his delirium.

The dissection of his body shew'd nothing that was worthy of remark, except

that the sanguiferous vessels, which creep through the pia mater, were, for the most part, distended with black blood.

5. This history we might have put in the number of those which relate to deliria, or even to convulsions. But because the jaundice appear'd first of all the disorders which came on, in consequence of the fright, I chose rather to give it you under this head. The jaundice seems to have been brought on by a contraction of the hepatic nerves: and the matter of the bile being, in great measure, retain'd in the blood, becoming acrid, and greatly affecting the brain, as in a young man, and a man given to letters, seems to have brought on all the other symptoms.

6. We will not search after other examples, among medical writers, which are to be compar'd, in many things, with the example of Valsalva (*b*), as we have two here in the Sepulchretum (*c*), one of Ballonius, in a young man, son of the Count de Chaulney, and another of Guarinoni in the Cardinal Sforza. This latter icteric patient had at first no fever, but what was latent, so that the physicians did not attend to it, till after it became more violent, when being seiz'd with a slight delirium, and afterwards with a fresh increase of fever, with a very great tossing of body, and not long after with two sudden epileptic paroxysms, and, finally, three days before death, being attack'd with various convulsions, he was nevertheless carried off gradually, and gently; the liver, and almost all the other parts of the body, being ting'd of a yellow colour, to a very great degree, and the lungs being in the same state, in which they are generally found, in those who have been long excruciated with a difficulty of breathing, at the time of their death.

But the young man, from a lively and good-natur'd disposition, being made morose, and melancholic, and being suddenly seiz'd with the jaundice, after fifteen days, when no such thing was thought of, gnash'd with his teeth, and was convuls'd in the night; was in an extasy as it were, and after great howlings and convulsions died: the brain being found in such a state, that the cause of death did not seem to have been there, the lungs being very much diseas'd, but the liver still more, so that it was *ὀπρόχλωρον* as it were; for thus the word ought to be written, and thus it is written by Ballonius, as you will see by looking into his second book of the Epidemics, which is quoted (*d*), not in page two hundred and forty four that is pointed out, but in page two hundred and fifty eight; and as this word signifies greenish, or palish, you plainly see that this young man agreed with the priest of Valsalva, in this colour of his liver also. And they all agreed in that stupor of mind, which Ballonius calls a kind of extasy, or trance, Guarinoni *levis desipientia* or a slight suppression of the senses, and Hippocrates, or at least the authors of the prædictiones (*e*), and *coacæ prænotiones* (*f*), *μώρωσις*, and have taught to be bad "from a jaundice:" interpreters render it by the word *stupiditas*, which signifies a stupidity, or dullness, of the internal senses, who are follow'd by Zachias, in an observation that confirms this, and is transfer'd into the Sepulchretum (*g*).

(*b*) Supra n. 2.

(*c*) Obs. 6. & in additam. obs. 5.

(*d*) Edition quæ una tunc erat, & diu fuit, parisiens.

(*e*) L. 2. n. 4.

(*f*) N. 2.

(*g*) Obs. 7.

But if you enquire, why there was not a furious delirium in all these patients, though there were convulsions, there is no doubt but this may be accounted for, and in some measure from the different age of the patients, the different temperature and disposition of the blood, bile, and viscera. Thus in the cardinal, the blood was fluid, and found without any coagulum in any part, of which kind Boerhaave (*b*) affirms it to be, in icteric bodies, so that “when taken from a vein it does not coagulate:” but in the priest of Valsalva, it had not only been concreted, when taken away from the vein in a proper vessel, but was also found to be concreted in the ventricles of the heart; for which reason, the stagnating blood appear’d about the stomach, in the form of redish points, and here and there throughout the belly, like many small glands which were inflam’d: and that blood of this nature has been sometimes found by anatomists, in the heart of other icteric patients, the observation of Zachias, which I have already pointed out, and another likewise of Bartholin, which you have here in the Sepulchretum also (*i*), sufficiently demonstrate; not to mention here my observation upon the porter, who was in great measure icteric, and whom I have describ’d to you on a former occasion (*k*), or another of Valsalva, on that icteric girl (*l*), which still more deserves our attention, because, though, except the mucous concretion in the heart, the remaining part of the blood was fluid, yet when expos’d to the air it coagulated.

But to this disposition in the blood to concrete, other causes must be added, both in this fluid itself, and in the brain, in order to bring on a delirium. And yet it is of no great importance, if the brain, not even at this time, nor when there were the most violent convulsions, appears to be injur’d. For that which was the cause of delirium therein, may escape the penetration of the eyes: and from the nerves being irritated, even on the outside of the brain, or from an irritation on the spinal marrow, which we must suppose to have had this effect in that priest, horrible convulsions may arise.

7. However, the brain was not found to be altogether uninjur’d, in that body, whether you attend to that which was observ’d in the dissection of the meninges, or even the very colour of the brain, which was not entirely natural, and was readily suppos’d, by Valsalva, to have receiv’d a tincture from the bile. For notwithstanding the substance of the brain is itself found to be yellow, sometimes in this disease, I do not, however, remember to have read many observations, wherein it was so found, perhaps by reason of the extreme smallness of the vessels, which go to the internal substance of the brain, in the first place, and in the second place, perhaps on account of their rarity. And this at least I can say, that some time ago, when I had, according to custom, a great number of heads in the theatre, in order to give the anatomical description and demonstration of the brain, observing a yellowness of the face, of the skin in other parts, and of the membrana conjunctiva of the eyes, in one of them, I inquir’d to whom it had belong’d, and found that it was the head of a man who had been asthmatic, and jaun-

(*b*) Prælect. in instit. §. 773.

(*i*) Obs. 24.

(*k*) Epist. 7. n. 11.

(*l*) Epist. 10. n. 7.

die'd, and had died the day before: through the external surface of the pia mater, I saw, in several parts, considerable spaces of a yellow colour, inclining to greenish; yet soon after, when the brain was dissected, I found the colour therein to be the same as it naturally is.

Again, when a like occasion was offer'd afterwards, notwithstanding I found the small quantity of water, in the lateral ventricles of the brain, to be of a yellowish colour, and the plexus choroides somewhat inclin'd to that colour, and the pineal gland itself, in other respects very short, and pretty hard in its body, and having a small substance adhering to its basis anteriorly, not sandy, nor yellow, but white, and towards its upper part having something in it like blood, or a sanguiferous vessel; I say, notwithstanding I saw this gland inclining from its usual cineritious colour, to an obscure kind of yellow; yet all the remaining parts, for I dissected them, preserv'd their native colour, so that whatever was medullary, I found to be extremely white. So also here in the Sepulchretum (*m*), after a long-continu'd jaundice, you will see that the substance of the brain was very white; although not only the meninges, and particularly the dura mater, but the cranium also, externally, and, in part, internally likewise, was yellow.

For this disease sometimes tinges the very bones with a yellowness, which, as some assure us, can never be wash'd out from the skeleton. How yellow the bones were in an icteric foetus, the observation of Kerckringius shows, which you will also read here in the Sepulchretum (*n*): nor is it to be wonder'd at; as, instead of blood, he found a yellow humour like gall, of the same kind with that which was found by Vesalius, in like manner, in Martellus a nobleman of Florence, as you would learn from this same section of the Sepulchretum, if his dissection, which is given imperfectly twice over (*o*), were once fully describ'd, as it is in another place (*p*).

However in all these places you should read Martellus, instead of Marcellus, which is falsely transcrib'd: and suppose that Van Helmont (*q*), himself, had lit on observations not unlike these, when in the mesenteric veins of two icteric patients, he saw that appearance, from whence he suppos'd “an excremental virus, or a yellow and stercoreous cruor, or a yellow liquid excrement, the consequence of a second digestion, which was preternaturally taken up into the veins, and dispers'd through the whole body,” to be the occasion of the jaundice; whereas it was a bile, which, by reason of its having not been secreted from the blood, in a proper proportion, either on account of its great plenty, or on account of the disease of the liver, as in Martellus, abounds at length, therein, to so great a degree sometimes, that the blood which is taken away, and the urine which is then discharg'd, appear to be perfectly like each other (*r*); and that not only in persons where the disease is to prove fatal, but even frequently in those who are to escape (*s*), which happen'd to them, or, at least, to that icteric patient in whom, as Baglivi (*t*) relates, “instead of blood, yellow water only, flow'd out from the nostrils, and from the cupping-glasses, which were applied to the sca-

(*m*) Obs. 3.

(*n*) Obs. 34.

(*o*) Obs. 8. §. 4. & obs. 20.

(*p*) L. 2. f. 11. obs. 36. §. 1.

(*q*) Vid. in hac Sepulchr. 18. sect. obs. 26.

(*r*) Vid apud Hoffmann. supra ad n. 3. cit. cap. 12. §. 4.

(*s*) Ibid.

(*t*) De experim. circa bilem.

"rifications," just as we read in Lower (*u*) of the recovery of that young man, who, having had a large effusion of blood from his nostrils, and being well-supported, in the mean while, with broths, began at length to have a fluid discharg'd from the ruptur'd vessels, which was more like broth than blood.

8. But among these parts which are observ'd to be the most easily, and most frequently, ting'd with a yellow blood, are the adipose membranes in particular, and those which are call'd *conjunctivæ* in the eyes. Valsalva suppos'd the fat to be the most prone of all the parts to contract the saffron-like colour, where the serum of the blood is only a little yellow. For he had found the fat to be of this colour, in many who were not affected with the regius morbus, and especially in three bodies, which he dissected almost at the same time, that is to say in a hydrocephalous patient, in a man who had been wounded, and in another who had been carried off by an ardent fever.

But this yellowness is so obvious in the white of the eye, in patients labouring under that disease, that the ancients seem to have been persuaded, thereby, to suppose that all objects appear yellow to those who have the jaundice, which Hoffmann (*x*) says, is call'd into question, by our Mercurialis in his *Prælectiones Bononienses*, by which he meant perhaps to say in his *Prælectiones Patavinae* (*y*), or rather, in his *Lectiones variae* (*z*). For in these writings, having brought the testimonies of Varro, Lucretius, Sextus Empiricus, Cassius the physician, and even of Galen himself, all of which affirm this circumstance, he put in opposition thereto the tacit testimony of other medical writers, who are silent upon the subject, and his own repugnant observation, in a great number of icteric patients. And he might have join'd with his own observation, a great number of others, without doubting but he would have of those who should succeed, by much the greatest part, assenting to his doctrine.

At least, even lately, although after Sydenham (*a*), Boerhaave also (*b*), had written the same as those ancients, that very learned man, Haller (*c*), has confess'd "that he did not find evident experiments to prove this observation," nor had he read, "that the cornea had been found yellow," in icteric bodies; and that not only a slight change of colour, in the humours of the eye, but a very great one, was requir'd, in order to produce this effect: as, for instance, when from blood being extravasated into the aqueous humour, according to the observation of St. Yves, the light appear'd to be red. And, indeed, Boerhaave seems to me, when he asserted this a second time (*d*), and produc'd another observation of his own very much similar to that of St. Yves, to have thought "that a little bile mixing itself with the aqueous "humour," might be compar'd with blood being extravasated therein. But it probably happens, from the extreme smallness of the vessels, going to the humours of the eye, as has also been said of the internal part of the cerebrum (*e*), that a tincture of the bile does not often reach thereto.

(*u*) Tract. de corde c. 2.

(*x*) §. 4. modo cit.

(*y*) L. 1. c. 32.

(*z*) L. 6. c. 12.

(*a*) Proceſſ. in morb. curand. ubi de ictero.

(*b*) Prælect. ad instit. §. 544.

(*c*) Adnot. ad eum locum.

(*d*) Prælect. modo cit. §. 340.

(*e*) N. 7.

To me, at least, when I formerly dissected the eyes of an icteric woman, no appearance of yellowness appear'd in any of the three humours: nor yet in the tunica cornea: which coat in this body, as in other icterical bodies, and particularly in that potter also, of whom I spoke above (*f*), though I examin'd it accurately, and, at the same time, when there was a great yellowness in the neighbouring tunica adnata, I could never find to have any yellowness in it. Yet it may sometimes happen, though very rarely, that objects appear yellow in this disease, that is to say, if the tunica cornea be universally saturated with bile, and not "then only, which even Mercurialis grants, but also if the humours of the eyes are, at any time, ting'd with a very great yellowness;" one or the other of which, or, if you please, both, you may suppose to have taken place, in the two examples, that Hoffmann (*g*) testifies his having seen, in favour of the opinion of the ancients; and in a third, in like manner (for I do not remember to have read any more) which is added by the celebrated Scardona (*h*).

9. And there may be in the eyes of some persons either a greater number, or a greater diameter, of the small vessels going to the tunica cornea, and to the humours, and, at the same time, in the blood of these persons, a matter of the bile which is more fit to pervade and tinge these small vessels, whether this depends upon the nature, and properties of that matter, or on its quantity. For we see after it is secreted, and deposited in its vesicle, that it passes more easily through the membranes of this reservoir in some bodies than in others, and, in like manner, that it tinges the contiguous parts in some bodies with a very deep and saturated colour, and in others with a very slight one, or with none at all.

That is to say, the blood, from whence it proceeds, if you choose to express yourself in the words of Willis, which you see produc'd here in the Sepulchretum (*i*), "is too much inclin'd to a sulphureo-saline dyscrasia," in "some, and in other has "the sulphur too much deprest'd:" for which reason also, as the former are very prone to the jaundice, so the latter, says he, "are perfectly free from this disease," as he saw in many cachectic and phlegmatic habits, although "labouring under an obstruction, and inducing "ration of the liver, in respect to most of its ducts." Which hypotheses, however, we must admit with caution, or wait to distinguish the times, and the changes, which the jaundice itself brings on, lest you should be afterwards surpris'd, when you read, in the same place, the observations of Hildanus (*k*), or de Graaf (*l*). For the former asserts "that a pituitous "and cacoehymic patient had, at times, labour'd under the jaundice "for some years together;" and de Graaf, that the bile of an icteric body was "entirely serous, and ting'd with so slight a yellowness, that the linen "rags, which were dip'd into it, receiv'd scarcely any yellow colour therefrom."

But in regard to the quantity of that matter, the nature of which I have spoken of, it is surprizing how great an abundance thereof may be in some

(*f*) N. 6.

(*g*) §. 4. cit.

(*h*) Aphor. de cognosc. & cur. morb. l. 3. c. 10. comm. ad n. 8.

(*i*) Schol. ad obf. 1.

(*k*) Obf. 8. §. 13.

(*l*) Obf. 10.

bodies, if to that which the native constitution of the body, the time of the year, foods, and drinks, and other things of that kind, which happen to agree in one effect, have accumulated, another be moreover added; as, for instance, if a fever, if immoderate exercise in the sun, if poison, even that which is introduc'd into the blood by the bite of a venomous animal, and, finally, if any thing else of that kind, suddenly let loose those particles of sulphur also, which had been more constricted, and depress'd, in the blood, and carry them away to the liver, so that there are, now, more bilious particles, than it is possible for this organ to secrete.

There is, besides, another method still more known, by which the matter of the bile may be increas'd in the blood; as, for instance, when little, or none of that matter, which is in the blood, is separated therefrom, either on account of some disorder of the blood itself, or of the internal secreting organ, or on account of the passage of many branches of the hepatic duct, or of the trunk itself, or of the ductus communis being obstructed. For this being obstructed, although what is already secreted does not return into the blood, as many go on to think, yet fresh bile cannot be sent into the full and distended ducts; and, therefore, as the matter of the bile is not carried away from the blood, in the same proportion as it is increas'd therein, by the concocted aliments, it must, of course, be augmented more and more every day, and abound.

10. And in this way that I have spoken of, it may be obstructed by more rare or more frequent causes. In the number of the more rare are those which you read here in the Sepulchretum; as, for instance, the ductus communis reduc'd to the narrowness of a capillary vessel (*m*), or contracted into itself, like a solid chord (*n*), and indurated (*o*), or altogether solid and bony (*p*), or compress'd by some glands which lie round about it (*q*). And to the more frequent causes, in the first place belong convulsions, and the *crispatures* arising from hence, which are propagated quite to the beginnings of the small branches of the hepatic duct, constringing and shutting them up, as they are the narrowest. And though this effect thereof cannot, from the very nature of the cause, fall under the notice of the senses, yet it is so consentaneous to reason, that we may, without any scruple, make use of this hypothesis, to explain those jaundices, which have their origin, either from violent affections of the mind, or from pains.

There are, also, very learned men, who thus explain the jaundice that is brought on by the bite of the viper, from whom I should not dissent, if the intestinal faeces are but white at that time, as the strong constriction of the orifice of the ductus communis, from convulsion, which they suppose, requires: but if they continue to be yellow, and even yellower than usual, I shall then go on to understand and explain the case, in the same manner that I just now told you (*r*), before any obstruction of the passages was spoken of.

Moreover, among the more frequent causes, are to be number'd the obstructions happening in the other vessels, as well as in the biliary vessels,

(*m*) Obf. 14.

(*n*) Obf. 17.

(*o*) Obf. 25. §. 7.

(*p*) Obf. 16.

(*q*) Obf. 11.

(*r*) N. 9.

though it is my intention, chiefly, to consider the latter in this place, whether the obstruction of these tubes is made by some particles being secreted with the bile, which are grosser and more viscid than they ought to be; or is owing to calculi generated from these, and from the bile, by which the branches of the hepatic duct, or the trunk itself, or the ductus communis, are stuff'd up. And I do not say, the cystic duct, for this reason, because the obstruction of this passage is not able, of itself, to impede the passage of the bile from the liver to the intestines; although there have been many in former times, and are some even in ours, who, in spite of the admonition of Wepfer (*s*), "that a jaundice did not follow the obstruction of the neck of the gall-bladder, unless the ductus communis, also, is obstructed," have themselves suppos'd that men became jaundic'd, not only from a calculus sticking in the cystic duct, but also from a calculus in the cyst.

In regard to which opinion, that you may plainly perceive what is to be thought thereof, whatever remains of this letter (and a great part of it does remain) will turn upon the consideration of bilious calculi; since those things which I have hitherto hinted at may be sufficient for you to attain to most of the other causes of the morbus regius, and, at the same time, to open a way to those things which remain to be said on the subject of bilious calculi, either when within, or on the outside of, the liver.

11. These calculi are generated in the liver, "very frequently," and found in dissections, according to what Platerus asserts in the Sepulchretum (*t*), and Henenius (*u*), who says they are "often so large as would scarcely be credible." To both of whom I will not deny but it might have happen'd so. But as to what Matthiolus has suppos'd, in dependance upon certain reasons (*x*), that stones are generated "in the liver very frequently, as they are in the kidneys," I confess if I attend to the almost innumerable dissections of the human liver, made by Valsalva, and by me, I cannot readily assent to his opinion. For although both of us have found calculi in many kidneys, it never happen'd to me to find more than one in the liver formerly: and Valsalva never found one, in all his dissections, that I know of.

But when I say these things, I mean no more than to consider that comparison betwixt the calculi of the kidneys, and the liver, as I am by no means ignorant, even from the Sepulchretum itself, by how many eminent men they have been found, or taken notice of, in the liver. For besides those three whom I have mention'd, I see that the names of our Fallopius (*y*), Scaligerus (*z*), Trincavellius (*a*), Dodonæus (*b*), Camenicensis (*c*), Peucerus (*d*), Blasius (*e*), Heerius (*f*), Dobrzenskyus (*g*), for so his name ought to be written, are produc'd: to which I could add others, and among these Columbus (*h*), Forestus (*i*), and Reverhorstius (*k*): none of whom, however, has suppos'd ob-

(*s*) In additam. ad hanc 18. Sepulchr. sect. obf. 4.

(*t*) Sect. 17. 1. hujus 3. schol. ad §. 1. obf. 13.

(*u*) Obf. cit. §. 2.

(*x*) Sect. hac 18. schol. ad §. 12. obf. 8.

(*y*) Obf. 13. cit. §. 6.

(*z*) §. 4.

(*a*) §. 7.

(*b*) Sect. 18. cit. obf. 4.

(*c*) Ibid. obf. 8. §. 12.

(*d*) Cit. obf. 13. §. 3 & 8.

(*e*) 9.

(*f*) 10.

(*g*) Sect. 16. obf. 5.

(*h*) De re anat. l. ult.

(*i*) L. 19. obf. med. 14.

(*k*) Dissert. de mot. bilis §. 52.

servations of this kind to be frequent. If you examine each of these authors separately, you will, perhaps, be surpriz'd, that except Dodonæus, Camenicensus, and Dobrzenskyus, there is not one who makes mention of the jaundice in these patients, or even describes the ductus communis as shut up with a calculus, or the liver full of small stones.

But you will cease to wonder, when you attend to this circumstance, that it is not sufficient, in order to shut up all the passage of the bile, that a few and small calculi have been form'd in the liver, nor even that large calculi have been form'd there, unless they are lodg'd in such a part as beset the larger branches of the hepatic duct, and entirely shut them up, either by compressing or obstructing them, which may be also brought about by small and innumerable calculi, "filling" the whole liver "on every side," as Dodonæus says, not lying at a distance from each other, "in a scatter'd way," as was seen by Forestus; for when they adhere in all the smaller branches of this duct, they produce the same effect as if they stop'd up the trunk itself.

12. But I have said that the passage of the bile is prevented from calculi, either by means of compression, or obstruction. For if any one should say that calculi are sometimes form'd in the little glandular bodies of the liver themselves, and that to this class, without doubt, belong'd those lesser calculi, which Riedlinus (*l*) saw "on the external surface of the liver," I should not contest his opinion, although I believe they are more frequently generated in the very branches of the hepatic duct, as those who have very minutely trac'd them, have found. And as, certainly, nothing had happen'd more frequently to Ruysch (*m*), in oxen and sheep, than to find calculi in the pori biliarii, so nothing happen'd "more rarely," than to find these concretions in the "parenchymatous substance of the liver itself;" so that, although he very attentively "dissected away all the fleshy part," in more than a hundred livers, yet he found in one only, a calculus "buried in the parenchymatous substance, and not at all affix'd to the porus biliarius."

Nor can I suppose, that the ancient observations of Platerus (*n*), of hepatic calculi resembling "a tophaceous concretion, ramified in the manner of coral, and hollow internally," are to be refer'd to any other part, than to the same biliary branches, especially as I read Glisson (*o*) expressly asserting, that similar observations "of tubuli of so great a length, that if they could but have been taken out in their perfect state, they would, like coral, have resembled a great number of the ramifications of the porus biliarius, in one continu'd stony series," were made by him on the livers of oxen, and even within the same pore or duct. The branches of which Reverhorst, also (*p*), found to be internally beset with a calculus crust, in the body of a man.

Nor have I found calculi, in the human liver, in any other place than in these branches (*q*). Nor do I suppose that those stones, which by Columbus (*r*), and Camenicensus (*s*), were suppos'd to be found in the vena

(*l*) Eph. n. c. cent. 3. obs. 45.

(*m*) Obs. edit. cum dilucid. valvular. in lymphat. 24.

(*n*) Schol. cit. ad obs. 13.

(*o*) Anat. hep. c. 7.

(*p*) §. 52. cit. supra ad n. 11.

(*q*) Epist. anat. I. n. 43.

(*r*)

(*s*) Locis cit. ad n. 11.

portarum, had any different situation: yet my reasons for thinking thus, although not sufficiently attended to by some authors of eminence, as I have already given them on a former occasion (*t*), I shall not repeat here. These calculi, therefore, when at length from tubular bodies, by continual and fresh accretions of similar matter, they are made perfectly solid, as happens in aquæducts, must, without any doubt whatever, occupy the whole passages whereof I have spoken, and prevent the transit of the bile.

13. I have also said this; that calculi of the liver, though large, do not bring on a jaundice, is not to be wonder'd at, unless they are in such situations as necessarily to obstruct these passages. And I believe that this disease was present, for I cannot now positively affirm it, in a certain man, whose liver had a stone in the center of the concave surface, of the form and magnitude of a pigeon's egg, as an anatomical friend of mine, who had dissected the body, inform'd me by letter, many years ago. But I do not wonder that this disorder had not been observ'd in three women, who, although they had a much larger stone, or a greater number of concretions, and more heavy ones, within the membrane of the liver, nevertheless, had them in such a situation, that they seem'd to be rather on the outside of the liver, than within its substance: and this was the reason I did not make mention of them above. For that membrane being drawn away from this viscus, by the included weight, and being extended downwards, had form'd a sacculus in two of them of the length of a span; for in the third it was describ'd only as a follicle, pendulous downwards.

This last observation is from Benivenius (*u*), and is totally different, as you will easily perceive by comparing them, from the second, which is given in the Sepulchretum (*x*), from the third chapter of his book. And a similar observation to his; except that in the sacculus not many calculi were contain'd, but one large calculus, only, was included, together with a great quantity of glutinous humour, and that the woman never complain'd of any thing but of a heat in her liver; the observation of Georgius Greifselius (*y*), is subjoin'd. And it was in consequence of bearing these examples in my mind, and observing therefrom, that besides the gall-bladder itself being enlarg'd, another kind of cyst, distended likewise with a fluid, might sometimes hang below the liver, which, although it was entirely preternatural, would, nevertheless resemble this natural cyst; it was in consequence, I say, of reasoning from these examples, that in the case of Laurence Bacchetti, formerly a physician at Padua, the history of whose disease, and dissection, two other learned men have publish'd, since Dominic Militia (*a*), I carried myself with so much caution, as not to affirm any thing for certain, though I made no scruple to declare my opinion.

This gentleman had a tumour hanging below the liver, which you immediately felt by applying your hand to the abdomen: it was globular, and moveable, so that you could easily bring it towards the right side, or towards the left, by means of the hand with which you laid hold of it. When different physicians seem'd to have different opinions, as you will read

(*t*) Epist. 1. cit. n. 49.

(*u*) De abdit. nonnull. &c. c. 94.

(*x*) Sect. 17. obs. 13. §. 1.

(*y*) Ibid. §. 11.

(*a*) De morb. exitial. nob. virgin.

in Militia, who declares the several opinions of all; to me, who saw him once after others, this tumour seem'd to be the gall-bladder, enlarg'd by an immoderate distension of fluid, and produc'd downwards, which I declar'd to Dominic Stephanelli, a physician, and friend of the patient, who with great politeness attended me home, and very earnestly desir'd my opinion; yet I made this declaration in such a manner, as to affirm nothing for certain. What I had thus declar'd was so evidently confirm'd by the dissection, that although the declaration might be pass'd over by some, yet the appearance itself could be conceal'd by no body.

I had seen the same thing before, and particularly in an old man, from whom I had already describ'd it, in the first of the *Epistolæ Anatomicæ* (b). And I remember'd to have read of it very frequently, and not only among the ancients, as when Vesalius (c) found, in Martellus, the same cyst, "of the bigness of two fists," or when Fernelius (d) said that it is sometimes distended by exuberant bile, "into a very large size;" but among the more modern authors also, as, for instance, in Zwingerus (e), who saw it "about six times larger than is natural," but particularly the younger du Verney (f) and Yungius, whose observation of one of a still more monstrous size, is taken notice of by Abraham Vaterus (g); so that after this I do not think it worth while to point out those which have been since produc'd, nor yet to inquire how great a cyst was found by Lancisi, which, by reason of its very remarkable length, Pacchioni intended to describe, as he expresses himself in a letter which he wrote to me in the year 1710. Although two observations, which I lately read in the writings of the very illustrious Van Swieten (h), are by no means to be neglected: the first from those of the illustrious society at Edinburg, who found this cyst to contain eight pounds of bile, and that in a boy not more than twelve years of age; the second made by himself, who, in the body of a woman, found the same cyst to be so distended, as to reach quite to the right os ilium, and this cyst had protuberated, by its own bulk, betwixt this bone, and the lower ribs, even before her very lean carcase was cut into.

But it was also found to be extended, in a Polonian senator (i), "to so surprizing a degree," that in the living body, "it could be felt by the hands." To return, however, to those things which were publish'd at that time, which was in the year 1732, although I very well remember'd them, yet not unmindful of those three observations, that I pointed out in the first place, of a facculus hanging down from the liver, nor yet of the admonition, in the latter end of the sixth book *de morbis popularibus*, that even good physicians, "not to mention others," are often deceiv'd by "appearances," I was not willing to imitate Baglivi, who, if he were living at present, and should read what is written by our Vallisneri (k), and Scheffelius (l), would certainly repent of having written too hastily, and in conse-

(b) N. 43.

(c) *Epist. de rad. chin.*(d) *Pathol. l. 6. c. 5.*(e) *Art. n. c. tom. 1. obs. 78.*(f) *Mem. de l'acad. r. des sc. 1701.*(g) *Differt. qua calculi in vasis. fell. &c. thes. 5.*(h) *Comment. in Boerhaav. aph. §. 950. &*

935.

(i) *Commerc. litter. a. 1733. hebdom. 11. n. 2.*(k) *Opere t. 3. p. 6. lett. 37. annot. 1.*(l) *Differt. de lithiasi fell. §. 28.*

quence of attending to some observations, but not to all that it was in his power to attend to (*m*), “when you see obstinate jaundices, or those that have been cur’d, return afresh, you may take it for granted, that these are produc’d by a calculus of the gall-bladder, and for this reason you may pronounce them incurable.”

14. But in order to treat of these calculi of the gall-bladder, according to my promise, inasmuch as their situation certainly is on the outside of the liver, let me first observe, that there is so great a number of observations, of these concretions being found in the human body, that the list of those which relate to the calculi of the liver, admits no idea of comparison therewith. And if you inquire after the reason of this difference, you will find more than one, when you attend to the causes which are advanc’d, for the generation of calculi in the cyst being so frequent.

Our Vesslingius (*n*) has suppos’d the thickness of the cystic bile, and its very long stagnation in that cavity, by which the meatus cystici, and valvulæ, are much streighten’d, and less passable. And these causes you will find so peculiar to the cyst, that the greater part of them are not, by any means, transferable to the hepatic ducts, and it is surprizing that a very eminent physician, among the more modern, who has acknowledg’d these very causes of the difference we are speaking of, has not equally observ’d that they are also common to the cow species; in which, as he there confesses, that hepatic calculi are more frequent, so he ought, at the same time, to have assign’d some cause of this difference betwixt the human species, and this species of animals.

But those things, which Vesslingius had previously demonstrated, were, in the mean while, illustrated, and enlarg’d, by others; either by remarking a greater thickness of the bile in some men, and a greater disposition to concretion; or by acknowledging a longer retention than is natural, by reason of the spasmodic crispatures, and constrictions of the cystic duct; or by reason of the power of self-contraction being deprav’d, and weaken’d, in the relax’d coats of the vesicle. And this weakness of the coats becomes so much the greater afterwards, in proportion as a greater quantity of bile is retain’d, just as it happens in the urinary bladder, when from the quantity of retain’d urine its power of contraction is weaken’d, and overcome: which is a simile that was not only us’d formerly by Galen (*o*), but has even been us’d by the younger du Verney (*p*) in the present age: and from hence you understand what is, in general, the principal cause of those vast enlargements of the cyst being brought on, which I spoke of just now.

To these causes others were, moreover, added by Abraham Vater (*q*), whose name ought not to have been suppress’d by those who wrote the same things afterwards. For he, having remark’d how difficult it is for the bile to ascend, on account of the declivity of the fund of the cyst, and observ’d the necessarily slow passage thereof, on account of the obliquity of the duct, judg’d, from considering both these causes, that the cyst being compress’d by the stomach, none but the thinnest, and most fluid, part of the bile was squeeze’d out, and that the thickest was always left behind, in healthy bodies,

(*m*) De experim. circa bilem.

(*n*) Synt. anat. c. 4.

(*o*) De loc. aff. f. 5, c. 7. haud ita procul a fine.

(*p*) Cit. supra ad n. 13.

(*q*) Obs. rariss. calcul. 3. §. 1.

which would easily concrete, unless it was presently diluted by a new afflux of hepatic bile, and restor'd to its former consistence.

But when this fresh afflux is either less than it ought to be, or the bile is secreted in a more viscid state than usual, it does not fully answer the purposes of dilution, and renovation; for which reason the inspissated bile of the cyst more easily degenerates into calculi. And Fernelius (*r*) had trac'd out these causes to Vaterius, and, in some measure, even to Vesslingius, when he asserted that these calculi "had their origin from yellow bile, which having been long retain'd in its proper receptacle, and not timely evacuated, nor diluted, and renovated, by a new influx, grows hard in a surprizing manner."

15. Since, therefore, in this great infirmity, and intemperance, of human life, so many causes, which must be readily granted, are at hand to favour the production of cystic calculi, there is not the least reason to wonder that they have been so often found, both by the ancients, and by moderns. For after Gentilis (*s*), and Niculus (*t*), had testified their having seen concretions of this kind, the latter in the gall-bladder, and the former in the meatus thereof, Benivenius (*u*), Vesalius (*x*), Curtius (*y*), Falloppius (*z*), Fernelius (*), Stephanus (*a*), Columbus (*b*), and Coiterus (*c*), to take no notice of authors of less note, produc'd their observations to the same effect: and from the time that human bodies began to be more frequently dissected, even to this very day, no writer in anatomical, or medical, matters has had occasion to speak pretty fully of that vesicle, but he has made mention of calculi being seen by him there; so that it is with justice the celebrated professor Fabricius (*d*) says, that calculi of the gall-bladder have, in general, been more frequently observ'd than those of the urinary bladder; and it is shown by the illustrious Haller (*e*), that they are even to be met with more frequently in some countries.

Wherefore I would not have you be surpriz'd, if I say, that while I write this present letter, I have before my eyes, at least two hundred observations of this kind, nineteen of which are my own; but I would rather have you wonder that I have not read, or do not remember, a great many more. Yet those, of which I have spoken, are not so few in number, but that I may from them venture to answer your inquiry, as to what occurs more frequently, or more rarely, in cystic calculi, and that without seeming to answer too hastily, or rashly. You may make this inquiry first of all, in what kind of bodies they are most frequently found? For Carolus Stephanus (*f*) has asserted, that they have been seen by him, "chiefly, in women, who were pretty far advanc'd in life:" and, in this age, Frederick Hoffmann (*g*) has said, "that they are found very rarely in men, who are in the flourishing time

(*r*) C. cit. ad n. 13.

(*t*) Apud Donat. de med. hist. mirab. l. 4.

c. 30.

(*u*)

(*x*) Cit. supra ad n. 13.

(*y*) Comment. in mundin. anat. ubi de hepate in fin.

(*z*) Obs. anat.

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(*) Cit. ad n. 14.

(*a*) De dissect. part. corp. hum. l. 3. c. 42.

(*b*) De re anat. l. ult.

(*c*) Obs. anat.

(*d*) Propempt. ad dissect. Jo. Barth. Hoffmann.

(*e*) Opusc. pathol. obs. 33.

(*f*) C. 42. modo cit.

(*g*) Med. rat. t. 4. n. 2. f. 2. c. 3. §. 12.

"of life, but more frequently in old men, and still more frequently in women than in men." The first thing pronounc'd by Hoffmann, therefore, is much more true than the last. For I see in the observations spoken of, that the number of males and females is nearly equal. But although I find old people, promiscuously, of both sexes, to the number of sixty-one, whose ages are particularly pointed out by the observers, I find no more than eight who are said to be young: and among these there is no infant, and but one child; and the least age, amongst these eight, is that of twelve years, and the greatest nine and twenty.

Without doubt, in a flourishing time of life the juices are thinner, more briskly agitated, and less prone to concretion, than in the decline of life, or as Hoffmann particularly saw, than in the less laborious life of very old men, especially, and women. For which reason Haller, whom I have already commended, accounts for "the frequent calculi of the gall-bladder, which he found in criminals, who had been long confin'd to prison," from the want of muscular action (*b*). And to the same cause, you must refer what the illustrious Van Swieten (*i*) found to happen in bile, which was not agitated. For, "having left it to putrify in a pure glass vessel, he found calculous coagula in the bottom of the vessel." Yet the middle age, although it is an active season of life, has not juices to be compar'd with the flourishing prime of our age, for which reason it happens, that this time of life cannot equally resist the injuries of intemperance, and of the passions, to both of which it is still more liable than old age. If you add to this, that a great part of the women in the lower classes of the people, do not lead a very sedentary life: and if you compare all these things with those which are said above (*k*), upon the causes that produce calculi of the gall-bladder; you will, of course, easily perceive that the observations are consonant to reason.

16. But if you now inquire, whether Reverhorst (*l*) has written truly or not, when he has admonish'd us, that we might remark, in regard to these calculi, "that the younger the body is from whence they are taken, the more pale are they in their colour, that in a middle age they are of a yellow low colour, but in a more advanc'd time of life of a darker yellow, or even almost black," it will be much more easy to give you an answer to this question. For it is not the question, here, what is more frequent, but what is perpetual; so that I can readily affirm, even from inspecting my own observations, that this is too hastily pronounc'd. For I have found not only blackish, but very black calculi, in many of a middle age likewise; in a young man of five and twenty, and in an old woman of seventy-five (the former of which is the youngest, and the latter the oldest, from whose gall-bladder I have hitherto taken calculi) they were not very different in colour from each other, so that they were neither black in the old woman, nor very pale in the young man, especially if you compare them with one of a cineritious colour, which I found in a woman of sixty years of age within one.

But that you may not depend upon my observations alone, I have, certainly, not read of calculi being found in a younger woman, than that virgin

(*b*) *Experim. anat. de sang. mot. c. 6.*

(*l*) *Comment. in Boerhaav. aph. §. 950.*

(*k*) *N. 14.*

(*l*) *Dissert. de motu bilis §. 57.*

of nineteen, who is describ'd by Bonetus, in the former book (*m*). Yet in her all the stones were "yellow, and resembled bile in their colour." On the contrary, that woman, whose history is accurately describ'd by Cajetanus Tacconus (*n*), was of an advanc'd age, that is of sixty-three years, and affected with a black jaundice besides. Nevertheless, all the calculi from her body, "not only inclin'd to a whitish colour, or dilute saffron hue;" but, notwithstanding they were internally yellow, were furnish'd with coats that were "white, and shining, and resembled the internal silver surface of mother of pearl."

And, without doubt, the age is not to be so much consider'd, as the matter of which they are, or have been, made, for they do not always bear the colour of the bile in which they are found; and this colour, according to the various disposition of the blood, or of the organs, may sometimes be, or have been, of a different nature, or the bile may have even hid, under the same colour, particles of a different kind, though at the same time of life, and equally proper to form calculous concretions. Thus Abraham Vater (*o*), thus the celebrated Trew (*p*), to pass over other observations of my own, and those of different authors, met with them in the manner I am speaking of; for the former "found a calculus, in a very thick and black bile, which was of a colour inclining to white," and the latter, in bile which was of a bright yellow, found a calculus that was, externally, "in great measure white, and brown in other parts, but became very white, by means even of the slightest friction," yet internally, if you excepted "a kind of redish spot, it was pale," and the former of these appearances was in a man, and the latter in an old man, not in any young man.

17. Nor do they more favour the opinion of Reverhorst, who have, in general, affirm'd that these calculi "are found to be black, blackish, or brown, for the most part:" although, as I know that the calculi found by our ancestors, and by others, have been frequently of a colour of this kind, so myself also confess, that I have more frequently found them in the former years of my observations, than in the latter; yet a great number of mine, and still a greater number of the observations of others, must of course slip my memory, before I can easily believe that these concretions are "for the most part" found to be of that colour. Kentmann, (as you read in Schenck (*q*), writing of these calculi in general, says that they are "all of a colour approaching to yellow, which is, by degrees, chang'd into a deep yellow, or saffron colour, as they increase in their size," and indeed he soon after produces examples "of a kind of yellowish calculi," and "of a yellow one" being found here by our Falloppius.

But a much greater number of instances are added, in the writings of the same Schenck, of concretions of a different colour. And this must be granted: but then other observations are to be set in opposition thereto, as of Joannes Francus (*r*), who saw calculi "of a saffron colour," as of Cæsalpi-

(*m*) Sepulch. l. 2. f. 4. obs. 35.

(*n*) De rarissimis hepatis affectibus, observ. obs. 1.

(*o*) Dissert. qua calculi, &c. thes. 4 & 5. (r) Ibid.

(*p*) Commerc. litter. a. 1743. hebdom. 32. n. 3. & hebdom. 36. n. 4.

nus (*s*), who saw them of the same colour, as of Boschus (*t*), who found them “of a citron colour,” as of Panarolus (*u*), and Dobrzensky (*x*), who found them “of a yellow colour.” Nor indeed are Hoechstetter (*y*), Schelhammer (*z*), Steinius (*a*), and Bierlingius (*b*), to be pass’d over, by whom “yellow, yellowish, and saffron colour’d calculi” have been seen; nor yet Hortsius (*c*), nor Helwigius, (*d*), by both of whom a great number was found; those being all of a “yellowish colour” which were seen by the latter, and, in part, by the former.

To these you may add Platner (*e*), and Bezoldus (*f*), one of whom found them “of a golden yellow colour,” and the other “of a yellow colour inclining to white,” and not only these but even many more, among whom are the members of the laudable society at Edinburgh (*g*), who found “yellowish calculi,” in a boy of twelve years of age, and the celebrated Trew (*h*), who saw them “slightly yellow externally,” even in the body of a person who had liv’d more than seventy-four years, and still more the celebrated Haller (*i*), as he saw, even in a woman who was said to be more than a hundred years of age, perhaps all the calculi, but, at least, one of them in particular, of a yellow colour.” The same author having found sixteen in another old woman (*k*), says that thirteen of them were “yellow:” and that in a man who had been hang’d (*l*), they were of a yellow colour “inclining to white.” But Weitbrecht (*m*) even found them to be “yellow,” in an old man.

Other observations, besides these, I have either just now taken notice of, or shall take notice of hereafter: and still others, and those not few in number, I shall purposely pass over; for it is not my intention to point out them all, but only as many as are sufficient to show, that these gall-stones are not found, “for the most part,” of a black or brown colour. And even Vater (*n*), Hoffmann (*o*), and Bezoldus (*p*), when they treated of the colours of these calculi, in general, put among the number of those, which are “commonly,” or “more frequently,” observ’d, “the concretions of a yellowish hue,” as is the expression of the two first; and Bezoldus has particularly said “that they” most frequently incline to yellowness.”

18. And although a great number of those who have mention’d cystic calculi, have been silent in regard to their colour, yet there are so many who have not been silent upon this head, that it sufficiently appears they generally are found to be either of a yellow, or a black colour. I say generally, because blue concretions have also been seen, as by Coiterus (*q*), Ne-

(*s*) Quæst. med. l. 2. in ipso fine.

(*t*) De facult. anat. lect. 2.

(*u*) Jatrol. pent. 5. obs. 22.

(*x*) Eph. n. c. a. 1. obs. 129.

(*y*) Obs. med. dec. 10. cas. 9.

(*z*)

(*a*) Apud Scheffel. diss. de lit. fell. §. 10.

(*b*) Sepulchr. l. 4. f. 1. in additum. obs. 12. n. 2.

(*c*) Ibid. l. 2. f. 7. obs. 125.

(*d*) Ibid. l. 3. f. 7. in addit. obs. 1.

(*e*) Progr. edit. 17. mart. a. 1746.

(*f*) Dissert. de cholelitho cas. 1.

(*g*) Cit. supra ad n. 13.

(*h*) Commerc. litter. a. 1734. hebd. 6. n. 5. in fin.

(*i*) Opusc. pathol. obs. 33. hist. 4.

(*k*) Ibid. hist. 11.

(*l*) Ibid. hist. 13.

(*m*) Commerc. litter. a. modo cit. hebd. 9.

(*n*) Dissert. supra ad n. 13. cit. thes. 3.

(*o*) C. 3. supra ad n. 15. cit. §. 2.

(*p*) Dissert. modo cit. §. 5.

(*q*) Obs. anat.

retius (*r*), and Goritzius (*s*), who also observ'd "small red points," perhaps from the particles of the adhering cyst being lacerated here and there: for this calculus was so streightly confin'd in the cyst, that there was a necessity of extracting it by force: and they have been seen of a red colour, as by Cameniceus (*t*), and by Bartholin (*u*): of a cineritious, as by our Fabricius (*x*) and Boscus (*y*): of a whitish colour, as by Reverhorst (*z*), by Vater (*a*), by Haller (*b*) by Van Swieten (*c*); and even of a silver colour, as by Platerus (*d*): of a golden colour, as by the same (*e*), and in part by others; for I have not undertaken to mention every one in this place: and finally, of a green or greenish colour, which is much more frequent than those last spoken of, or others which for the sake of brevity are omitted, so that I have very often seen the same, the cineritious sometimes, the golden-colour in part now and then, but the others I have never yet seen.

Nevertheless I have also seen calculi of a variegated colour, in the manner I have describ'd them in the epistle sent to Schrockius (*f*); and Gerbezius (*g*) saw them of a brown colour mix'd with white; Baeumlinus (*h*) of a white and yellow, inclining to green; and many others, that were contain'd even in the same cyst, distinguish'd with spots of bright red, or scarlet hue, and with others of pale or a grisly colour. Out of which colours, and others that are just now mention'd, you cannot properly call any one black. And to these you may, moreover, add the calculi which are without, or almost without, any colour: of which kind was that large one found by Scultetus (*i*), which not only fill'd the cyst, but even distended it, and was "pellucid like chrystal;" or those that the royal surgeon Tamponettius (*k*), and Manchius (*l*), formerly found, the latter "transparent, though friable," and of the bigness of a filbert," and the former "shining and soft like a concreted gum, and of the bigness of a pigeon's egg," (so that it brings to my mind one describ'd by the celebrated Heister (*m*), which, beneath a rugous surface, "had a substance, and, in general, a colour, not far unlike a gum, which is somewhat more solid than gum arabic) or that which is "represented, in a plate, by Bezoldus (*n*), of the form of a chrystal, and "perfectly pellucid," found by Henricus Albertus Nicolai, and pointed out in the fifth observation (*o*).

That whitish calculus, also, which I have more than once mention'd from Vaterus (*p*), was pellucid and transparent:" to which, if you attend less to the colour, you may add from the Sepulchretum (*), those thirty found by

- (*r*) Apud Schenck. obs. cit. supra ad n. 17.
 (*s*) Eph. n. c. cent. 8. obs. 20.
 (*t*) Epist. ad Matthiol.
 (*u*) Cent. 3. epist. med. 86.
 (*x*) Apud Schenck. obs. cit.
 (*y*) De facultat. anat. lect. 2.
 (*z*) §. cit. supra ad n. 16.
 (*a*) Diff. ibid. cit. thes. 4.
 (*b*) Obs. cit. ad n. 17. hist. 1 & 6.
 (*c*) Comment. cit. supra ad n. 15. §. 935.
 (*d*) Obs. l. 3. ubi de tereft. excret.
 (*e*) Ibid.

- (*f*) In act. n. c. tom. 2. obs. 147.
 (*g*) Eph. n. c. cent. 1. obs. 57.
 (*h*) Commerc. litter. a. 1743. hebdom. 28. n. 2.
 (*i*) Armata chir. obs. 61.
 (*k*) Zodiac. med. gall. a. 1. April. obs. 7.
 (*l*) Ibid. mai. obs. 8.
 (*m*) Act. n. c. tom. 1. obs. 181.
 (*n*) Dissert. de cholelitho §. 5. fig. 4.
 (*o*) Dec. obs. illustr.
 (*p*) Thes. 4. hic cit. & 5.
 (*) L. 3. f. 17. in addit. append. ad obs. 2.
 §. 1.

Scharpius, which were “pellucid like a carbuncle;” and perhaps, likewise, eighty more, which were found by our Sanctorius (*q*), “similar to the stones” call’d chrysolites,” I suppose like the chrysolites which are describ’d by Pliny (*r*), “transparent, and of a golden colour.”

But if you would consider nothing besides a shining property, in cystic calculi, others ought to be taken notice of here, as from Griselius (*s*) that which was a little less than a hen’s egg, and when broken, “shone as if it had been full of nitre;” or from Jo. Theodore Schenck (*t*), and Jo. Rhodius (*u*), those which were many degrees less than the last-mention’d, but being broken, in like manner, shone like chrystals “of tartar” or talc, as that also did like “talc,” which I first took notice of from Trew (*x*): and even to myself (*y*), the nucleus of some has appear’d to be distinguish’d here and there, with a kind of shining points. But that those “blue concretions” of Neretius (*z*), or Platerus (*a*), were shining, the former, at “one time, of a bright silver colour, and at another time, of a bright golden hue,” that is externally only; for I do not read that they were broken; has but little reference, I think, to those of which I just now spoke. To which I suppose, these that are describ’d by Baglivi (*b*), may be with more justice suppos’d to relate; for he says that they “almost emitted sparkles, as if they had been a congeries of black salt chrystalliz’d.”

However, to that class certainly belong, chiefly, those two which were not long ago describ’d by the celebrated Morand (*c*), one from the observation of the famous Geoffroy, and the other from his own, the former internally in part, but the latter externally, and internally, for the most part, shining, and almost quite pellucid: and to that class belong other calculi describ’d by other authors, and particularly by the very excellent Haller (*d*), which I shall more properly take notice of below (*e*), when I speak of the structure of gall-stones, not without that “chrystalline” calculus, if I am able in the mean time to find it any where in Hildanus.

19. For now it is necessary, previously, to touch upon a few things in regard to the various magnitude, number, figure, and situation, of these stones. There was a time then, when one of these concretions was not only found to fill, but also to distend, the cyst, as I said just now, and even to distend it “very greatly,” as you will see in the Sepulchretum (*f*). A calculus has also been found equal to the size of this cyst, of which you will have more than one instance, in the same place (*g*). At one time it has been “half as big as an hen’s egg,” as our Fallopius found it (*h*); and at another, as big as a pigeon’s egg (for I pass over the intermediate degrees of magnitude in the second and third, as I do in the first and second) of which size they have been seen by many after Coiterus (*i*); and amongst these by our

(*q*) Comment. in I. Fen. I. can. avic. qu. 76.

(*r*) Nat. hist. l. 37. c. 9.

(*s*) Vid. in modo cit. sect. 17. obs. 13. §. 11.

(*t*) Vid. ad Sachsi Gammarolog. epist. addit. 7. ad c. 14.

(*u*) Cent. 3. obs. med. 45.

(*x*) Supra n. 16.

(*y*) Obs. cit. 147.

(*z*)

(*a*) Locis Paulo ante cit.

(*b*) De experim. circa bilem.

(*c*) Mem. de l’acad. R. des sc. a. 1741.

(*d*) Opusc. pathol. obs. 33.

(*e*) N. 23, & 24.

(*f*) L. 3. f. 10. in addit. obs. 1.

(*g*) Ibid. f. 13. obs. 12. §. 7. & f. 18. obs. 8. §. 14.

(*h*) Apud Schenck. obs. 1. sit supra ad n. 17.

(*i*) Obs. anat.

Vallifneri (*k*), in the last of the Gonzaga family that was duke of Mantua, who suppos'd it to be an hereditary disease, for this reason, that Bartoletus (*l*) had likewise found a calculus at the orifice of the cyst, in Ferdinand Gonzaga, who was also a Mantuan nobleman: which would not have been an improbable argument, if this last duke had descended from Ferdinand, who, however, left no sons. But they are generally found to be of a much less size than these: and indeed are, sometimes, so very small, that Vesalius (*m*) compar'd those which he found in Martellus, to "millet seeds."

And as the gall-bladder, in this body, was certainly equal to the size of two fists, as I have even said above (*n*), and fill'd with stones of that kind, you may easily imagine, from hence, how great a number of them is sometimes met with. They who have actually number'd them after Fallopius (*o*), who, with that pretty large one, found "a hundred and twenty-three," have reckon'd not only "three hundred," as Bartoletus (*p*), or "three hundred and six," as the brother of Platerus (*q*), more than which I have even found; but above "seven hundred," as Mentzelius (*r*), and even "above a thousand," as Grassecius (*s*) did formerly; so that it is surprizing, that some, speaking in general of the number of cystic calculi, should have stop'd at the number of Joach. Camerarius (*t*), that is at a hundred and forty-three. And what will you say to an instance, which is already publish'd by the celebrated Storchi (*u*), of an ancient nobleman, in whom "more than two thousand of these calculi were reckon'd up;" and another, in like manner, by Fasci (*x*), who, in the enlarg'd cyst of a certain man, "found three thousand six hundred and forty-six granules of concreted bile, which he even us'd to show as a curiosity." And although sometimes there are no more than one calculus, as was demonstrat'd just now, yet it is much more common to find a greater number.

And as to what relates to the figure, moreover, some of them, indeed, are nearly spherical, some almost oval, or of some other figure, that is not at all angular, as even the likenesses, which are made use of by observers to describe them, demonstrate; as, for instance, that of some species of nut, an olive, an egg, or other things of a similar kind: but they are for the most part angular. And these spherical calculi receive their form from the figure of the vesicle itself, whether this be natural or contracted, or enlarg'd, and made more globular, by disease, especially when they fill it, and that whether there are no more than one, or more than one, provided they are as yet so soft (for even those that are pretty large, sometimes (*y*) preserve the softness of new cheese) as to allow of their being all squeez'd together into a form of that kind; as you see in the Sepulchretum (*z*), that instead of bile, "there was one orbicular stone, consisting of nine other triangular stones,

(*k*) Epist. supra cit. ad. n. 13. adnot. 2.

(*l*) Vid. Rhod. cent. 3. obs. med. 2.

(*m*) Epist. de rad. chin.

(*n*) N. 13.

(*o*) Obs. 1. modo cit. apud Schenck.

(*p*) Obs. 2. Rhod. modo cit.

(*q*) L. 3. cit. supra ad. n. 17.

(*r*) Eph. n. c. dec. 1. a. 9. obs. 181.

(*s*) Apud Schenck. in sine obs. 1. modo cit.

(*t*) In eadem 1. obs.

(*u*) Commenc. litter. a. 1735 hebdom. 59. n. 4.

(*x*) Vid. in obs. 68. tom. 5. act. n. c.

(*y*) Eorund. t. 3. append. n. viii. append. 1. ad obs. 10.

(*z*) L. 3. f. 17; obs. 14. §. 5.

"lying mutually upon each other, and easily separable by the hand." A similar observation to which is extant (*a*), (except that it is much more surprising, on account of the exactly equal partition of weight, and, for that reason, almost incredible) "of a calculous globe weighing two ounces and "a half," which, being taken out of a cyst that contain'd nothing else, "separated into sixty lesser calculi, obscurely yellow, and friable, each of "them having five surfaces, and being equal to the weight of one scruple "exactly." But other examples of cystic calculi are also extant, which, resembling a pigeon's egg (*b*), "seem'd to be made up of lesser calculi," or were even "compacted," (*c*) or "compounded, of mere granules (*d*)."

Shall we then say that granules of this kind are the first beginnings of cystic calculi? They are certainly often found in the vesicle, for to those which I have here produc'd, you may add many and many other observations, of the same bodies, as in a virgin spoken of by the younger du Verney (*e*), and in a man mention'd by the celebrated Jo. Sebast. Albrechtus (*f*); as, in the former, the bile was concreted into so many little grumous corpuscles, and in the latter, was "like granulated sugar, or had the form of "blanch'd millet seeds;" and not to be too prolix, as in so many other bodies (*g*), in which there being calculi "of a granulated surface," or "full of "tubercles in the form of a mulberry," the granules seem to have adher'd to the surface, and been form'd into one substance therewith. It is not to be doubted therefore, but these are the beginnings of those calculi, which consist of granules of concreted bile. But in the cyst, together with the calculi, a great quantity of "sandy and mucous matter (*b*), and a large quantity "of sand," has been, more than once, found, so that the same person, to whom this occur'd, judg'd "that it was to be consider'd, without any "doubt, as the matrix of the calculi:" and this person was Bergenius (*i*). Therefore, if the bile be accreted to a grain of sand, as to a nucleus, you see that this is to be look'd upon as another beginning of these calculi. To these add others, which have been observ'd by me, at other times, and which I shall take notice of with more propriety below (*k*); and you will, at once, conceive that granules of concreted bile, cannot possibly be the beginning of every calculus.

But as I have said that these calculi are, for the most part, angular, perhaps you will ask, from whence I derive the origin of these angles? If many calculi which are as yet soft, and round, are compacted into one, either oval, or spherical, body, in the manner I have describ'd, in two instances just now produc'd, so that from the compression of one against the other, they acquire these new forms, and after that, from any cause whatever, are separated, it is very easy to conceive of the origin of these angles. Yet be-

(*a*) Act. modo cit. t. 5. obs. 129.

(*b*) Commenc. litt. a. 1745. hebd. 24. n. 1.

(*c*) Eph. n. c. cent. 8. obs. 20.

(*d*) Haller. opusc. pathol. obs. 33. hist. 13.

(*e*) Cit. supra ad n. 13.

(*f*) Act. n. c. tom. 4. obs. 49.

(*g*) Eorund. act. t. 1. obs. 20. cum tab. 3.

fig. 3 & 4. & eph. cent. 5 tab. 1. fig. 3. 4. 5

& 6. & Haller. obs. cit. hist. 5.

(*b*) Commenc. litt. a. 1733. hebd. 45. post.

n. 6.

(*i*) Et a. 1739. hebd. 39. n. 1.

(*k*) N. 22.

cause examples of this kind very rarely occur, we generally account for these angles, from the friction of the round calculi, against each other.

For who can deny the existence of this friction, that observes the smoothness of their surfaces, or who looks upon those two cystic calculi, which are delineated in the works of Hildanus (*l*)? For one of them "is so greatly hollow'd out, that it can admit almost a third part of the other," which, says he, must have been done, "without doubt, by the continual friction of one against the other; and similar appearances to this, he might have sometimes seen, in calculi of the urinary bladder likewise, from a similar cause.

Consider also that large one, which is describ'd and delineated by the celebrated Bechmann (*m*), and which, consisting of three parts, had extended the cyst. When you see how much the middle part, in particular, enter'd into the lower part, and attend to the exact polish of the surfaces, which were contiguous to each other, you will, beyond a doubt, affirm that this was owing to friction.

20. But with how many angles these calculi have been furnish'd, of what kind these angles were, or in what manner they were plac'd, or what figure they, for the most part, have put on, it is not easy to determine from the observations of others, not only on account of the great variety, that there, frequently, is even in those which are contain'd in one and the same vesicle, but still more, by reason of the proper signification, and strict sense, of words being frequently neglected, in pointing out the figures, by those who ought by no means to have been thus careless, or by the description of those figures being neglected, which were proper to give an idea of their form. Indeed when I read Vesalius describing (*n*) eighteen calculi, which he had found in the cyst of a man, "as form'd in the manner of a triangle, with the sides and "surfaces every where equal;" I seem to myself to have an idea of a tetradrum properly so call'd.

But on the other hand, when many others call them "triquetri," or "triangles," or "triangular," I neither know whether they saw them in the form of a prism, or a pyramid, nor, whichever form they saw them in, whether comprehended under equal or unequal planes. On the contrary, however, when Greiselius (*o*) says that he had found four pretty large "cubic" stones, together with an almost innumerable quantity of other smaller stones, all which, as far as he could distinguish, "resembled a cube;" I have no doubt of his idea: but I am much in doubt, when many others say that they were "square," or "quadrangles," or "quadrangular;" for you see how many different species of parallelopipeds may be signified by these words.

However when I examine, attentively, all the calculi which I have in my possession, and I have a great number, I perceive, in the first place, that it is very difficult to find any perfect regular figure at all, in angular calculi, and I cannot help believing that Vesalius himself, and Greiselius, rather meant to be understood a figure, which approach'd very near to that of a tetraedra, and to that of a cube: and in the second place, I think that

(*l*) Cent. 4. obs. 41.

(*n*) Epist. de rad. chin.

(*m*) Commerc. liter. a. 1742. hebdom. 32. n. 1.

(*o*) Eph. n. c. dec. 1. a. 3. obs. 45.

cum tab. 2. fig. 10.

those who have call'd them triangular, or quadrangular, meant to point out a figure which comes near in some measure to that of a tetraedra, or a cube : and, finally, I suppose that as both of these forms, in consequence of not being perfect, if you so conceive of them, for the most part offer some surfaces to the eye, which, at first sight, seem more like the one, or more like the other, many have refer'd them to one class, and many also to the other; but if the calculi are examin'd accurately, in every part, I imagine that they will generally be found of that figure, which was formerly pointed out by me, in the first of the *Epistolæ Anatomicæ* (p). And that they have very often more angles than either of these figures requires, that which I there describ'd sufficiently demonstrates: and Kentmannus (q) has formerly taught; that they have many more, and the more in proportion, as there are more calculi contain'd in a cyst; however, though I confess that the first supposition does sometimes place, yet whether the second does I am greatly in doubt; and even if I attend to some observations of Greiselius, and of my own, I know that it is not always true.

But let us suppose what number of angles we please; wherever there are some very acute, or the surface of the calculi is very rough, they may, if a considerable weight is at the same time added, not only irritate the cyst, but sometimes also burst through it. A very extraordinary instance of which rupture you have in the Sepulchretum (r).

But irritation may excite inflammations, ulcers, and excrescences, which have been seen even by me (s), and, if with Wepfer (t), we compare the urinary and gall-bladder to each other, may at least bring on a preternatural thickness of the coats. For the urinary bladder “often becomes four times as thick as it naturally is, by the continual friction of the calculi upon it,” as he says, and as we shall see, in its proper place (u). And he also found the coats of the biliary cyst “preternaturally thicken'd,” and, as he thinks, from the same cause, as others also have sometimes, among whom are not only some of my disciples (x), but likewise the very learned Trew (y), who did not find it without a purulent matter, but, in particular, the celebrated Bezoldus (z), who describes these coats as being “harden'd, thicken'd, and, in a manner, cartilaginous,” although he enquires after a different cause from the calculi, which the cyst, in his example, and those just now pointed out, contain'd; and certainly a different cause may, at other times, with some justice be assign'd (a). But the surface of these concretions is frequently smooth, as Vesalius saw in that lawyer, especially if they are in the number of those that are yellowish, which we perceive, even when dried, to have a kind of greasy smoothness, as if they had been smear'd over with soap, an unctuous smoothness of which kind, I have, sometimes, observ'd to be still more considerable, in those that are of a greenish colour (b).

(p) N. 44. in fin.

(q) Apud Schenck. obs. 1. cit. supra ad. n. 17.

(r) L. 3. f. 14. obs. 5. §. 4.

(s) Epist. anat. 1. n. 43.

(t) In auctar. ad obs. de apopl. hist. 13. in fchol. n. 5.

(u) Epist. 42.

(x) Epist. ad Schrock. de quæ supra n. 18.

(y) Act. n. c. tom. obs. 140.

(z) Disp. de cholelitho §. 6.

(a) Vid. Sepulchret. l. 3. f. 21. obs. 4. §. 11.

(b) Epist. modo cit. ad. Schrock.

21. But as to what I have said of irritation, there is no doubt but this must take place then also, when the calculi are form'd within the coats of the cyst, provided they are rough, or large. And thus I suppose that the observation of Gendrotius (*c*), that is of a dysentery, from a continual discharge of bile into the intestinum duodenum, may be explain'd, whereas there were two pretty large, and unequal, calculi in the cyst, involv'd in a peculiar membrane. And you will suppose them to have been generated in the glands of the cyst, and that being increas'd therein, they had extended their situation between the coats, in which situation those glands, also, naturally lie. For you will remember that small biliary calculi were formerly found, and demonstrated, by me (*d*), in those glands which open'd by very evident orifices, and were, for that reason, less to be call'd into question. And that these had been very ingeniously found out, and acknowledg'd, by the celebrated Galeati also, in an observation very similar to mine, except that those orifices did not appear, I learn'd afterwards with pleasure, when the first volume of the commentaries of the Academy of Sciences at Bologna was publish'd (*e*). And I shall tell you below (*f*), that another very small calculus has been observ'd by me, betwixt the coats of the cyst.

For it is your business, now, to consider, whether in that observation of Greifselius, which I took notice of above (*g*), "the other coat that grew to the fund of the cyst, and contain'd a stone in the form of a cube, that was bigger than any of the others," is to be accounted for in the same manner. However, I have very little doubt, but the observation of the celebrated Ellerus may be thus explain'd, which, if I remember rightly I read some years ago, in the fourth volume of the Berlin miscellanies.

For I should readily suppose that the small, round, and yellowish calculus, which he found concentered in the fundus of the cyst, and surrounded with a membrane produc'd from the pellicles of that bladder, had been form'd in some one of its glands. And, indeed, I am also inclin'd to think it probable, that a calculus, which, from all its appearances, was biliary, had been form'd in no other place, as the thicker part of it lay hid in a certain sacculus, betwixt the coats of the cyst, and the other part stop'd up the neck of the cyst (*b*): so far am I from believing it to be prov'd by this observation, that the gall-bladder is not furnish'd with any glands. And, indeed, the cervix of this cyst cannot be stop'd up by a hard and thick body of that kind, but other parts must certainly be press'd upon, which are necessary to the actions of the cyst, or the cyst itself must be contracted, and crisp'd up, by the irritation; so that we need not be surpriz'd after this, if the secretion of its glands be either obstructed, or injur'd.

You may imagine me to have said nearly the same things, in regard to the experiments of those gentlemen also, who have tied up the meatus of the cyst, in the living animal. These glands, therefore, are not taken notice of by anatomists, but are known from certain observations, many of which

(*c*) Zodiac. med. gall. a. 1. maj. obs. 6.

(*d*) Epist. anat. 1. n. 56.

(*e*) Vid. in opusc.

(*f*) N. 29. in fin.

(*g*) N. 19. 20.

(*b*) Hist. de l'acad. r. des sc. a. 1735. obs. anat. 1.

kind are mention'd by me, in the first of the *Epistolæ Anatomicae* (i). In which, however, I have not, taken notice of "some glands that lie very "near to the cervix" only; unless, perhaps, the learned man suppos'd, at the time of writing, by a failure of memory, as frequently happens, that what I have there said of the urinary bladder, not under number ninety-six, but under number sixty-three, was said in relation to the gall-bladder.

22. Now since I have said more than I intended of the magnitude of cystic calculi, their number, figure, and situation, although many things, among others, that I have said may be useful in order to distinguish these concretions when they are discharg'd by stool; let us, at present, go on to consider the remaining marks, which are suppos'd to be more conducive to this purpose, I mean their structure, lightness, and propensity to take flame.

As to what relates to the structure, from the time in which Kentmannus (k) asserted that these calculi, if you broke them, appear'd, internally, to be "full of narrow circles surrounding each other mutually, so that any one "may observe, or, at least, any one who takes the slightest notice, in what "manner the viscid, and sluggish bile, had, by degrees, concreted, and "become adhesive, from the center quite to the surface," scarcely any one has risen up, who, speaking of their structure, and mode of accretion, did not agree with Kentmannus. Yet were there some things, which frequently, and in various calculi, ought, in part, to be corrected, by the help of repeated observations, and in part have others added to them.

For as to concentric circles appearing in sections, that may be true in round calculi, whether they are spherical, cylindrical, or oval, so that the section, in each of these figures, be made according to the perpendicular of the axis, as in the parts of the calculus, also, which are hemispherical, conic, or cylindrical, in their form, as you see, for instance, in the larger of those two represented by Hildanus (l). But if you divide angular calculi into sections, the external strata, of which they are compacted, must of course be far different from the circular form, and the internal strata, likewise, as far as I have seen, will be nearly of the same kind: and this you may see in the figure which is given you by the celebrated Trew (m), whom I have often recommended.

For these reasons I imagine they have spoken with more propriety, who, omitting the figure, have only mark'd out strata lying upon strata, as Boscius (n), who has said that, out of nine calculi, "layers had been concreted to "each other, in every one of them, as they are in an onion;" as Hildanus (o), who has said that his "were concreted in laminæ;" and, not to be too prolix, as Malpighi (p), who has said "that they are made up of a number "of involucra, mutually enwrapping each other;" I say, they have spoken with more propriety, than those who, when speaking of angular calculi, have mention'd circles to us, which you will find from the Sepulchretum (q), was

(i) N. eod. 56.

(k) Apud. Schenck. obs. 1. sæpius cit.

(l) Obs. 44. cit. supra ad n. 19.

(m) Commenc. litter. a. 1754. tab. 1. fig. 5.

(n) De facult. anat. lect. 2.

(o) Obs. modo cit.

(p) Op. posth.

(q) L. 2. f. 1. obs. 74.

done by Otto Heurnius, where describing a calculus "of a triangular figure, " extended into a pyramidal top, he says that cortical circles appeared there- " in, lying upon each other."

Nor is it sufficient to correct these things in Kentmannus. For among the black calculi, both spherical, and angular, which I have by me, the greater part of them, now, show no strata at all; only some few of the angular, that are the most firm, have an external stratum, but somewhat obscure in its appearance: the remaining substance is of such a kind, that we must pardon the ancient authors, whoever lit upon them, and particularly Piccolhominus (*r*), for asserting, that "the bile being burnt in the cyst, like a coal, was " converted into blackish calculi," and he even might have said extremely black, with justice, if he had seen these of mine. And I heartily wish the same indulgence could be given to men, in other respects very learned, who, in the great light of this present age, forgetting that, after so many diseases, join'd with very great heat, no stones are, generally, found in the gall-bladder, have imagin'd that some of these, which happen'd to be found without any bile, were to be ascrib'd to a violent fever that had preceded, which, having consum'd all the aqueous part of the bile, had converted the remainder into stones.

But it is not sufficient to except these black calculi, in order to reconcile with truth, the other things that Kentmannus has said, I mean that the others are, at least, full either of circles, or strata of a different kind, "from the " center quite to the circumference," or as others, in general, say, of all the calculi hitherto known, that they are made up of concentric strata, which descend even to the smallest nucleus. For I would have you see what observations have been made by me in the *Adversaria* (*s*), in the first *Epistola Anatomica* (*t*), and in the letter sent to Schrockius (*u*), on the nature of the nucleus, its softness, and its magnitude in particular, in so many and so various calculi, as I am not willing to repeat them here. You will, at least, perceive that I have found no small quantity of medullium, in proportion to their bulk, and so much the greater, in proportion as they were more increas'd, and that full of a soft, and moist bile, and consequently, that no small part of each of them, internally, is so far from consisting of these strata, that it is necessary to enquire, by what means the bile can penetrate inwards, through these strata which are already firm.

You will also perceive other things, that are purposely pass'd over here, as, for instance, that the cuboidal calculi, which I have cut into, do not consist of smaller calculi of the same figure, but, like the others of which I have spoken, of bile invested round about with strata: that these are of different colours from each other, and sometimes alternately so: and, finally, that they are, not uncommonly, seen to consist of a great number of small lines, going towards the centre.

23. This direction of the lines puts me in mind of a certain structure of these calculi, differing from that which Kentmannus has advanc'd. Nor has this great number of small lines only, which I just now mention'd, as being ob-

(*r*) L. 2. anat. prælect. 20.

(*t*) III. animad. 28.

(*s*) N. 47.

(*u*) Vid. *supra* ad n. 20.

serv'd in each of the strata (and which have certainly been taken notice of by others also before me, as, for instance, by Maurice Hoffmann (*x*), when he describ'd calculi "made up, of striated laminæ, as it were) been sometimes seen, but even still more evident lines, or such as went from the center itself, in one continued course, to the circumference, as by Baëumlinus (*y*), who saw, in calculi, which, in regard to the order of the colours, agree, in great measure, as he says, with some describ'd by me, "saline spiculæ, as it were," running from the center to the circumference, "in the manner of striæ," or lines, so that they seem'd to be made up "not so much of lamellæ," as of striæ.

So Trew (*z*), in like manner, asserts that in another calculus, "no lamellated structure could be found, but it rather seem'd that radii were "running out from the centre, to the circumference, though in an obscure, "and confus'd manner," which the delineation, that is added, confirms (*a*). But Maurice Reverhorst (*b*); not to omit those who wrote before; when he delineates the sections of one, or two calculi, out of a great number, that he had extracted from the gall-bladder of an old man, in one, indeed, shadings out a kind of cortex, in the form of a circle, but in both represents lines, of no inconsiderable thickness, going, in the manner of radii, from the center, to the periphery. And John Baptist Contulus (*c*), having given figures of stones, (such as they are, and like the rest of his performances) found in this cyst, and among them, of one found by him, "which was diaphanous at its extremities," gives a section, as it seems, of another, also, taken from I know not where, in which, indeed, are seen many circular strata, but a much greater number of lines, going from the center, to the circumference.

Moreover, I remember a peculiar species of calculi describ'd by Malpighi (*d*), which he suppos'd to have been form'd by concretion, "from a kind of "mucous substance, that very much resembled soap, or, rather, resembled "camphor," he says, therefore, "that they are of a surprizing structure, "for that they resemble the lapis judæicus, and are made up, internally, "of elegant lamellæ, drawn from the circumference to the center, which "lamellæ are easily separated one from another." And although he suppos'd it to have been generated "in the liver, and in the porus biliaris," I believe because he had heard that a stone, which his friend Bonfiliolus preserv'd, was found "in the liver" of a nobleman in Germany, yet he could not, for a certainty, know that another of this kind, which he says he had seen, "and which was discharg'd, together with the intestinal fæces, after great "pains, and a long jaundice," by a matron with whom he was acquainted, had been generated in the same place. For that some calculi, which have come from the gall-bladder, have been, without doubt, discharg'd by stool, will be shewn below (*e*), and that in this cyst also, concretions are sometimes form'd, of a structure very similar to that whereof we speak, may not only

(*x*) Eph. n. c. cent. 9 & 10. append. 1. obs.

35. (*y*) Commerc. litter. a. 1743. hebdom. 28.

n. 2.

(*z*) Ibid. hebdom. 36. n. 4.

(*a*) Tab. 1. fig. 26.

(*b*) Diss. de motu bilis tab. 2. fig. 3.

(*c*) De lapidib. &c. c. 11.

(*d*) Op. posth.

(*e*) N. 46.

be conjectur'd from what has been already said, but will be confirm'd immediately, by other observations.

For that transparent calculus of Vater, which is taken notice of above by me (*f*), had not only very slender, saline, and shining, striæ on its surface, but was also "concreted in the manner of striæ:" or if there should be any doubt about this, there certainly will be none in the description, and figures, of those two which I have pointed out from Morand (*g*). For both of these has splendid, and pellucid lamellæ, the one indeed with strata lying round them, but the other without any, and going, in the manner of radii, from the centre to the circumference. And, lately, the illustrious Haller (*h*) has propos'd others "which were shining like chrystal, and semipellucid," the substance of one of which calculi, that was spontaneously broken, "being almost like selenites, shining, and stretch'd out from a yellow center, in the manner of radii, to the investing cortex, was made into crusts; and small laminae." The other calculi, which "were smaller, were, likewise, internally laminated, in the manner of selenites, and shining."

24. All these observations, join'd with the others, which I have before mention'd, of shining and pellucid gall-stones (*i*), will certainly induce you to suspect that many of these calculi, which are discharg'd by stool, have been too hastily suppos'd not to have been generated in the cyst, but in the stomach, and intestines, and for this reason, because they seem'd to be too far distant from the more general nature, and structure, of cystic calculi. And one in particular which occurs to my mind, on this occasion, is that describ'd by Donatus (*k*), from Cornelius Gemma, and which show'd, "internally, a substance like the purest glass, or transparent chrystal, with many striæ, and radii, jointly running into one center."

It seems, indeed, to be an objection to our suspicion, that this concretion was "very large." But besides that it will be shown below (*l*), how much the biliary ducts may be dilated, and even how much they have been found to be dilated, I would have you believe, with Gemma, from the seat of long-contin'd pain, and tension, in the right *ilium*, under the false ribs, not that it had been concreted in the intestinum cæcum, as he imagines, but that being delay'd there, in its passage downwards, it had gain'd a fresh addition of substance, on its external surface, which was partly of a brown, and partly of a black colour, and by this means had grown into that considerable bulk.

So I would have you suppose, that another large calculus, which is describ'd, and delineated, by Bezoldus (*m*), had receiv'd additional strata in its passage, that were much fewer in number, where "an almost chrystalline nucleus," had been form'd, which seems to be very properly represented in the plates, not without some striæ being drawn from the center, to the circumference thereof. And the discharge of this calculus, had been preceded by pains of the right hypochondrium, of a much longer continuance: nor does Bezoldus, himself (*n*), fail to imagine it possible, that it might have come from the gall-bladder.

(*f*) N. 18.

(*g*) Ibid.

(*h*) Opusc. pathol. obs. 33. hist. 7.

(*i*) N. 18.

(*k*) Cap. 30. cit. supra ad n. 15.

(*l*) N. 46.

(*m*) Disp. de cholelitho cas. 2. & fig. 2 & 3.

(*n*) Ibid. n. 7.

In regard to the two observations, of stones discharg'd from the intestines, which he immediately subjoins, the one large, the other smaller, you will determine as you think most proper. For the first, certainly, points out no feat of the long-continu'd pain in the belly, and the second says not a word of pain. Yet when you read that a calculus is spoken of in the former, whose "internal shining substance shew'd mere circles, intersected with striæ," and have examin'd the figures of Schroëckius the father, who was the observer (*o*), which agree very well with this description; perhaps you will not suffer even this calculus to escape your suspicion. But in regard to the lesser concretion, of which you will find no more said by the author, Brechtfeld (*p*), than by Bezoldus, if you enquire whether, as this calculus, like the three former, and that, moreover, which was seen by Malpighi (*q*), was discharg'd by a woman, it happen'd to be discharg'd by an old woman, as we know was the case in the three former observations; in regard to this lesser concretion, I say, it will perhaps be sufficient for you, that it was "internally "whitish, and shining, like chrystal," supposing, that in a very succinct, and close description, the structure might easily be omitted, which, as in other pellucid concretions, also, taken notice of above (*r*), would, if the stones had been broken asunder, probably have appear'd to be of the same kind, with that describ'd in the last.

But lest you should, perhaps, be liable to indulge your suspicions with too much freedom, call to mind, by way of contrast, the observation of the celebrated Chomel (*s*): who found a sacculus, in a decrepid matron, into which the coats of the intestinum duodenum had relax'd themselves, containing a considerable number of calculi, of which if you read the description, when examin'd externally, and, at the same time, know that they were made up, internally, of strata lying round each other, and, pretty near to the center, of striæ dispos'd in the manner of radii, betwixt which, white and shining particles were interpos'd, you may very easily consider them as biliary concretions. And yet you must of necessity acknowledge, with Chomel, that they were generated in the same intestine, unless you would rather chose to admit one of the hypotheses, which I shall mention: I mean, either that this sacculus had communicated with the ductus communis choledocus, where it passes obliquely betwixt the membranes of that intestine, and had receiv'd from this meatus, first one calculus, and then others, which had relax'd the membranes by their additional weight; or that the first calculus, immediately upon its destruction from the duct, and its entrance into the intestine, had, from some cause or other, been detain'd there, and by overloading the coats, and by forcing them outwards, and downwards, had prepar'd a sacculus for itself, and the other calculi, which were to come after.

But although you might, perhaps, confirm both explications, the former by the example of the sacculus wherein were the same kind of stones as in the gall-bladder, which sacculus seem'd, to the very experienc'd Galeati (*t*), to

(*o*) Eph. n. c. dec. 1. a. 9. obs. 90. fig. 3

(*s*) Hist. de l'acad. r. des sc. a. 1710. obs.

2 4. (*p*) In act. med. Hafn. vol. 1. obs. 100.

anat.

(*q*) Supra n. 23.

(*t*) Comment. de bonon. sc. ins. t. 3. inter medic.

(*r*) N. 18.

be in that part, where the ductus communis choledocus had, now, come near to its termination: and the latter by the authority of no other person than Chomel himself, inasmuch as he accounts for the formation of the facculus, from a calculus generated in the intestinum duodenum, nearly in the same manner as you account for it, from a calculus which had fallen therein: although, I say, you might, perhaps, make use of these arguments, yet I would not have you seem to be too suspicious.

25. And I could wish that those marks, which Reverhorst (*u*) has suppos'd to be quite sufficient, to distinguish cystic calculi, from calculi of the intestines, were, at all times, in effect, as sufficient for this purpose, as they are, at sometimes, really useful. His words are: "the proofs of these calculi, that is, whether they really come from the gall-bladder, or not, is that those which are biliary, not only take flame themselves, when applied to the flame, but, also, when thrown into water, by no means sink to the bottom, and even swim upon the surface, by reason of the oily particles of the bile, of which these stones are compos'd."

However, not to inquire here in regard to other biliary calculi, whether they are to be thus distinguish'd from cystic concretions; Bidloo (*w*), at least, when writing a few years after, "that calculi, arising from bile, swim on the surface of water, and are inflammable by being applied to the fire, of whatever colour, figure, or magnitude, they may be," has immediately added these words, *ut plurimum autem*: which must be suppos'd to signify that these marks, though general, are not universal, and without exceptions; though, whether this addition has been taken notice of, by any one of all that number, by whom these words of his are either quoted, or refer'd to, I do not very well know; I confess, however, that I myself have not attended to them, before this time.

Besides, to speak first of their lightness, as I shall speak hereafter of their inflammability; Scheffelius (*y*) admonishes us, that Reverhorst "is refuted" by Valentine, "not only by a similar calculus not swimming upon water, but also by *agagropoli*, or globular concretions, found in the intestines of wild-goats, swimming in water, although they are not generated in the gall-bladder." But I even find that Otto Heurnius has asserted, many years before all these (*z*), that three calculi, found by him in the gall-bladder, "had not swam upon the surface of water, when thrown upon it, as many affirm they will, but had subsided." There is no doubt but he had those authors in his eye, whom I have before mention'd (*a*), as Fernellius, Riolanus, and others, among whom was, also, Hollerius (*b*). Nevertheless, men of the most considerable reputation still continu'd to follow these authors, and Reverhorst, for a long time, out of whom it is sufficient to have mention'd Ruysch (*c*), and Bergerus (*d*): nor are some persons wanting still to follow them, as they assert, without any exception, that these calculi all swim in water.

(*u*) Diff. de motu bil. §. 57.

(*w*) Vindic. contra Ruysch.

(*y*) Dissert. de Lithiasi fell. §. 14.

(*z*) Obs. cit. supra ad n. 22.

(*a*) Animadv. ibid. indicata.

(*b*) De morb. intern. l. 1. schol. ad c. 48.

(*c*) Thesaur. anat. 5. n. 32.

(*d*) Phylolog. med. l. 1. c. 14.

And, indeed, such was the success of the experiments with them : as it was with others, likewise, either at that time, or afterwards, as with Cunradus (*e*), Tremelius (*f*), Trew (*g*), the Edinburghers (*h*), and others. But with some the experiments did not at all answer, as with Jo. Conrad. Fabricius (*i*), or did not answer wholly, though in part they did answer, as with Lancisi (*k*), who saw ten of them “subside in wine and water,” which very calculi, nevertheless, “swam in vinegar,” as with Weitbrecht (*l*), who, in making the experiment upon the same number, found, “that if thrown into water, immediately upon their being taken out from the cyst, they were specifically heavier than water, but that when they were dried, they became lighter.”

I, however, having first observ’d some (*m*), and afterwards a great number, to sink down in water, resolv’d to inquire whether these exceptions could be reduc’d to any certain heads. And I soon perceiv’d (*n*), that no exception could be drawn from the colour. I inquired therefore, whether they could be taken from any other property. But it will be easy for you to see, from those observations which I have communicated to Schroeckius (*o*), how difficult it must be to determine any thing of this nature, in so great a variety, not only betwixt different calculi, but also betwixt the same, if you only change the time, or any other circumstance. Yet when you have read what I have written on this subject, upon more than one occasion, you will learn some hints, that are useful to prevent us from forming too hasty a judgment of the situation, in which calculi, that occur to us, have been generated; you will also find some observations, which have been since given almost in the same manner, even by an illustrious physician, whether he had read them in my works or not.

But when you inquire from whence it happens, that some of these calculi swim, and others subside, whether because in the former is a greater quantity, and in the latter, a less quantity, of the oleose particles, which, either by reason of their certain figure, leaving a great number of spaces betwixt each other, or from some different cause, are wont to swim upon water, as we see oils and resins in general do, or because the first mention’d kind of concretions, of whatever matter they consist, have more intervals of this kind interspers’d betwixt their component parts, that is, intervals fill’d up with air, a very great quantity of which, the celebrated Haller (*p*) makes no scruple to suppose, from the observation of Hales, is actually contain’d in bilious calculi; I lay, when you inquire into this circumstance, then you will, perhaps, not be displeas’d with the observations, that I have made upon the bubbles which are discharg’d from, or adhere to, them in water, if they should happen to have any tendency to explain the return, in particular, of those which, having first fallen down, restore themselves again to the surface, or, at least, endeavour to restore themselves.

(*e*) Eph. n. c. dec. 3. a. 9 & 10. obs. 171. ad n. 7.

(*f*) Act. n. c. tom. 8. obs. 10. ad d.

(*g*) Loco indicato supra ad n. 23.

(*h*) Cit. supra ad n. 13.

(*i*) Propemptic. cit. supra ad n. 15.

(*k*) De subit. mort. l. 1. c. 20. n. 4.

(*l*) Cit. supra ad n. 17.

(*m*) Epist. anat. l. 1. n. 43.

(*n*) Ibid. n. 45. 46.

(*o*) Obs. indic. supra ad n. 20.

(*p*) Ad Boer. praefect. §. 250. not. r.

It will also be of use in your inquiry, to compare my observations with those things, which my friend Stancario (*q*) has formerly hinted, of bubbles adhering to other immers'd bodies, and of their power in raising them up in the circumambient fluid, and which Petit, the physician (*r*), has much more copiously profecuted. In reading of whom, you will likewise learn the effect, which heat, added to the water, will have in causing those bodies, that would otherwise swim, to descend: and this circumstance being transferr'd to bilious calculi, shows another cause, moreover, from whence the experiments may vary, and would even render these experiments, which I, in general, made in the cold seasons of the year, after the publication of the first *Epistola Anatomica*, liable to suspicion with me, if I had not made them with water just warm, but not hot.

26. But the reason of their inflammability is too obvious to need our present inquiry. Yet I do not remember that any mention was made of this property, before the times of Cortesius (*s*), who says, "it is found by experience, that stones generated in the gall-bladder burn like fat." Who after him has affirm'd that this property is common to them all, which some even still seem to believe; and who has admonish'd us that this is true of them "in general" only, was shown you a little while ago (*t*). And what various observations I have made upon the burning of different calculi, and what kind I have seen take, cherish, and preserve the flame, and what I have seen do the contrary, is not only said in the *Adversaria* (*u*), and in that *Epistola Anatomica* (*x*), but also in the latter part of the other letter which I sent to Schroec-kius (*y*).

From these writings you will learn many things, but this in particular, that those remarks, which are delivered by a certain celebrated writer in medicine, in regard to "all" bilious calculi, even all that are in appearance of a certain nature, are not to be understood to relate to all, upon which I, and others, have made experiments, but to all, upon which he, himself, has made them. There is no doubt but under the same external appearance, a different nature, and number, of component particles may lie hid, in different calculi: nay they sometimes do not lie hid, if you examine them with great accuracy. To that illustrious man Haller (*z*), who chose to apply a great number of different calculi to the fire, instead of throwing them into water, it happen'd, that except those which he calls calcarious, all the others took flame, and among those the black ones likewise.

But were these internally black also? At least in describing them to be black, in the second, tenth, and eleventh histories, in the latter, and, in like manner, in the tenth, he mentions, nothing but an "external crust," or nothing but a "shell," which were "black;" and in the second, he says "that when the outer shell was taken off, which was black, and thin, a bilious yellowness succeeded." You find, therefore, from an accurate description, that the nature of those which were inflammable in his experiments, was different from the nature of others which, being black, not only externally, but internally also, or internally, in particular, very black, I have said did

(*q*) Vid. Vallisner. oper. t. 1. p. 6.

(*r*) Mem. de l'acad. r. des sc. a. 1731.

(*s*) Miscell. med. dec. 2. c. 9.

(*t*) R. 25.

(*u*) Ill. animad. 28.

(*x*) N. 49.

(*y*) Obf. indicata supra ad n. 20.

(*z*) Opusc. pathol. obf. 33.

not take the flame, or when taken, did not preserve it, by which experiments, chiefly, it is made commonly known, that there are some calculi which are not inflammable. And to these I afterwards added others, though not black ones, which, in like manner, had not any inflammable principles; but of these there is no necessity to take notice here.

27. After making so long a discourse upon these calculi, particularly that they may be distinguish'd from other concretions, when discharg'd from the body, it becomes proper now, to say something of ascertaining their existence, if possible, when they lie latent within their vesicle, lest you should suppose that I have forgotten what it was that drew me into this long treatise. For it was the reprehension of him, who had pronounc'd that an obstinate, or returning, jaundice was a "certain" sign of the existence of these calculi, which gave rise to my discourse. But with how much more caution does Fernelius give his opinion (a), who only says, that we "ought in this case to be suspicious of these calculi;" and yet he laid this down, in particular, if both the cystic ducts, that is the hepaticus, and communis (b), were obstructed.

But, if even a jaundice of that kind, is no certain sign of gall-stones, it is not easy to say how much those gentlemen have been deceiv'd, who have imagin'd that they could not exist without a jaundice. And, in order to root out this notion entirely, from the minds of some physicians, where it yet remains, I can with the greatest certainty affirm, that notwithstanding the whole number of bodies, in whose gall-bladders I have found calculi, is nineteen, and the number in which Valsalva found them four, yet not one of all these had been affected with a jaundice. But as three of Valsalva's observations, and as many of mine, relate to letters which I shall hereafter write to you (c), you may, in the mean while, turn again to those fourteen which I have already sent you, in different letters (d), and join them with these three that I shall immediately subjoin.

28. A poor old woman had receiv'd a violent blow upon her head, by a fall: of which alone were all her complaints as long as she liv'd; and she liv'd not a few days, till at length she gradually sunk away and died. This patient had no inequality of the pulse, no traces of a jaundice. And the reason of my making this remark will appear, when I tell you what I observ'd in the heart, and the gall-bladder, while I was busied in pursuits of quite a different nature. For I did not even dissect the body, that I might know what detriment she had receiv'd from her fall.

The body was fat, and yet the skin very hard. In the thorax nothing occur'd to me that was worthy of remark; for to some of those who were present, it seem'd otherwise, in regard to a polypous concretion, that we found in the right auricle of the heart, which was whitish, and if you attempted to dissolve it with your hand, gave considerable resistance, as if we did not frequently see a crust of this kind lying on the surface of blood, which has been taken from a vein, and coagulated, or, as if this woman had been subject to

(a) Patholog. l. 6. c. 5.

(b) Vid. ejusd. physiolog. l. 1. c. 7. vid. etiam infra n. 33.

(c) Vid. epist. 38. n. 20. epist. 49. n. 2. epist. 56. n. 7. 9. 31. epist. 57. 10.

(d) Vid. ep. 3. n. 4. ep. 4. n. 13. ep. 5. n. 6. & 19. ep. 21. n. 2. 30 & 36. ep. 24. n. 16. ep. 26. n. 21. ep. 27. n. 2. ep. 30. n. 14. ep. 34. n. 15. ep. 35. n. 16. ep. 36. n. 4.

an inequality of pulse, which they are so fond of attributing to polypi of the heart.

In the belly, the stomach appear'd to be almost double, so suddenly was that cavity contracted, before it came to the antrum pylori.

The gall-bladder was half-full of bile, and, being of a bright yellow like orpiment, had ting'd all the neighbouring parts with the same colour. In this bile were ten calculi, of an unequal magnitude, among themselves, but none of them small. Other circumstances which relate to them, you will read in the letter to Schroeckius (*e*); for this is that woman of whom I there spoke in the third place, showing where, and at what time, I dissected her.

And from thence you may also learn, in like manner, what relates to another woman, the remaining part of whose history I shall immediately add: for it is she who is spoken of, in the first place, in that letter.

29. A woman somewhat younger than the former, yet almost sixty years of age, who was not only far from having an icteric colour, but endow'd with a very good complexion, was much given to drinking, and had been seven times married: this woman having complain'd of no other disorder, but of an inflammation of the thorax, of which she died, was dissected by me, not on account of her disease, but in order to examine into the abdominal viscera, and had some appearances in the genitals, but still more in the gall-bladder, which are not unworthy of being transcrib'd here.

The uterus had a tubercle externally, on the upper part of its fundus, of the figure, and magnitude, of a small filbert, partly prominent, and partly latent within the substance of the uterus, of a scirrhus hardness, of a white colour, both internally, and externally, and consisting of many different small parts which, in some measure, resembled cells contracted into themselves. And within the cavity of the uterus, from the middle and anterior part of the fundus, rose up a soft, and almost gelatinous excrescence. But although the testes, as was to be suppos'd from her age, were much shrivell'd, and very narrow, yet the cervix uteri, and vagina, appear'd differently from what you would have expected in the wife of seven men. For in the latter part, were still a great number of rugæ, prominent, even to half the extent of it, longitudinally; and in the former, the figure approaching to that of a virgin-cervix, and the valves, which were preserv'd on one side, made me suppose, that she had been the mother of very few children, which was also confirm'd by the slender rugæ, in the lower part of the abdomen.

But as to the gall-bladder, although it was much shorter than in proportion to the magnitude of the liver (which was, in other respects, of its usual sound appearance) for it did not reach, with its fundus, so low as the edge of the liver, but was distant therefrom by almost two inches; it nevertheless contain'd, together with a small quantity of bile, at least three hundred and thirty calculi, which were chiefly very small, as the shortness of the cyst, that I have describ'd, would of itself argue. As to the other remarks I made upon these calculi, I have said just now (*f*), where they may be met with: although in that letter, not only many typographical errors are admitted, but in the part, in particular, to which I refer, more than one whole line is omitted. Besides

(*e*) Vid. in act. n. c. tom. 2. ob. 167.

(*f*) N. 28.

the great number of calculi which I have mention'd, and which occupied the cavity of the cyst, I discover'd one with the knife that lay hid between the coats of this vesicle, which, in the blackness of its colour, and the smallness of its size, was very much like those that I took notice of above (g), as having been found in the glands of the cyst, at other times; yet the orifice of the gland was not so evidently laid open here.

30. The body of a very old man, who had been by trade a shoemaker, and who, by reason of his great age, was almost toothless, and had died partly of old age, and partly of a catarrh, within the space of three days, but without a fever, as was said, and certainly without a jaundice, as was manifest from the whiteness of his skin, was brought into the college about the end of January, in the year 1744, when I was teaching anatomy. As the whole of his body therefore, was carefully dissected, I will here relate all the præternatural appearances which I saw, beginning with those that were observ'd last of all.

The upper part of the cranium being taken away with difficulty, by reason of the very close adhesion of the dura mater, so that the external lamina of this membrane remain'd fix'd to the os frontis, the cerebrum and cerebellum were both of them found to be pretty soft, and somewhat brown in the medullary substance: the three ventricles of the cerebrum were full of pellucid and pure water: the plexus choroides were pale: the pineal gland was distended into the form and magnitude of a middle-siz'd grape, by a watry humour, as it seem'd: but the glandula pituitaria, if you look'd down upon it from above, was contracted, and sunk in its situation. The arteries that run upon the basis of the cerebrum, though they were not distended with blood, like the sanguiferous vessels within the ventricles, but were even empty, appear'd nevertheless, both in their trunks and branches, to be wider than they naturally are.

In the cavity of the thorax was a small quantity of turbid and brown water. The lungs were collaps'd, and fallen down to the back, in consequence of their being almost quite disjoin'd from the pleura. As the heart was larger than it naturally is, so the trunk of the aorta was also wider. And the valves prefix'd to this vessel, at the *aggeres*, as Valisalva call'd them, were become bony; and even one side of one of them consisted of a bony scale. But although through the whole trunk of the aorta, on its internal surface, and even the iliac branches of it, a whiteness was much more frequently propagated, here and there, than bony scales, yet I saw one of these in the curvature, and another near the third pair of lumbar nerves, neither of them very small, and both intercepted, by the internal membrane of the artery on one side, and on the other, by the fleshy annular fibres: and indeed there was a perfect ossification at the division of one iliac artery, into the external, and internal.

Besides, as the trunk of the aorta itself began to bend its course towards the left side, below the emulgents, and return again to the right side, before it gave off the iliacs, so the same kind of disorder, or unusual appearance, was continu'd into the iliac vessels, to such a degree, that, by their

frequent flexions, they nearly resembled the splenic artery. Nor were the carotids, and vertebrae, entirely free from this irregular disposition. And these flexions of the branches prevented me from attributing the incurvation of the trunk, just now describ'd, altogether to the contiguous exostoses of the lumbar vertebrae, the appearance of which was as follows.

Those thick ligaments, that are interpos'd betwixt the bodies of all these vertebrae, except the lower, were so prominent on their anterior surface, and especially on each side, like an air-bubble, that these prominences, on the right, and on the left side, were almost equal to the breadth of my little finger. All the prominences on the left side, whether because they had begun to be form'd before the others, or from what other cause soever, were bony. But of the right, that only seem'd to be bony, which corresponded to the interval betwixt the third and fourth vertebrae; yet it was not so; but a bony lamina, that form'd the surface of the body of the fourth vertebra, lifted itself above the level of the vertebrae, and in its elevation was also produc'd upwards, by which means it cover'd that prominence over with a bony crust: under which crust the nature of the prominent ligament was preserv'd. When I cut asunder one of the prominences on the left side, with a chisel, and the ligament, that was continued therefrom, with a knife transversly, those concentric lines it is true appear'd as usual; but every thing was ting'd of a pale and almost cineritious colour.

At length, the other contents of the belly offer'd the following things that were worthy of observation. The omentum was annex'd, on the right side, not only to that part of the intestinum colon, which is nearest to the beginning of it, but also to the small intestines, that lie in the neighbourhood of that part, and to the peritonæum. The stomach was not only more narrow than usual, but even was not a good figure. And the ring of the pylorus was somewhat swell'd in two places. Near to the other orifice, a certain roundish, and small kind of gland, was internally prominent, into the cavity of the stomach, which, when cut into, was found to be an encysted tumour; inasmuch as it was made up of a substance that was white, firm, and compacted into one body, of the same figure; but this body could be very easily disjoin'd from the thin membrane, in which it was contain'd.

The orifice of the stomach which was nearest to this tumour, that is the *stomachus*, as the ancients call'd it, was extremely large, as the gula which is continued therefrom was also, to the height of, at least, four inches above the stomach, in the whole of which tract it was more red, internally, than the other parts. And indeed I saw that the foramen, which is open'd in the septum transversum, in order to transmit the œsophagus, was much bigger than usual, particularly in its breadth, and that it terminated, at its upper extremity, by a right line transversly, instead of an angle.

When I examin'd that part of the omentum, which adheres to the stomach, with diligence, I observ'd, on the left side, not far from the fundus of this viscus, a kind of very small spleen, like a gland, receiving its sanguiferous vessels from the omentum, in which it was, and very much similar to the spleen in its colour, its coat, and the modification of its substance, unless that this last was somewhat more moist than that of the spleen, and of such a figure, and magnitude, that it might be compar'd with the spleen of a middle-siz'd hen. Besides this, another spleen was not wanting, which was
found,

found, and corresponded with the size of the liver, that was, likewise, found, and of its usual magnitude, or perhaps a little less.

In the gall-bladder, together with a small quantity of viscid bile, were six or seven calculi of no very small size, the largest of which was not less than a middle siz'd grape, pretty nearly round in its figure, yet of an unequal surface, as if from other very small calculi adhering to it. If you except some very small points of a yellowish colour, that were scatter'd up and down, through this surface, they were all, both internally, and externally, extremely black, and resembled a char-coal, not only in their colour, but even in their very substance. Most of these, after they were dried, fell into fragments spontaneously. And although they, before, seem'd to be light, yet those which were thrown into water, immediately sank to the bottom; and those which were applied to the flame, could neither by any means be made to partake of that flame, nor yet be dissolv'd in any part of them. One of the lesser of these calculi was in that part, where the vesicle begins to contract itself into the duct; yet it had not prevented the discharge of the bile, as we observ'd by compressing the cyst before we cut into it.

Finally, there being nothing in the kidneys worthy of attention, we open'd the urinary bladder, on the posterior surface of which, above the orifice, appear'd a kind of white protuberance, like a small inverted pylorus, somewhat larger, in its size, than the feminal caruncle was, to which it extended itself; yet the lower part of that protuberance, being contracted into a low and slender line, was prominent into the beginning of the urethra, and continu'd to the prostate gland; so that as it was of the same substance of which this gland, consisted, it seem'd, beyond a doubt, to every one who was there present, and very much practis'd in the dissections of these parts, that it was an excrescence of the prostate glands.

31. I heartily wish, as I have remark'd all the preternatural appearances, which were in the body of that old man, (for this reason, at least, that nothing should escape you, which, sometimes, may happen to be the occult cause of a considerable disorder) that we were not in the dark as to the effects of them, or the greater part of them, which had preceded in the living body. But it is sufficient, at present, to have known this, that although the gall-bladder contain'd these calculi, the man had, nevertheless, not been icteric, any more than the women I have before describ'd, and so many others pointed out above (*b*). Which, if it had happen'd to me only to observe it, I could the more easily forgive those who still hold a contrary opinion, for neglecting, or affecting not to know.

But besides the observations of men of gravity, and authority, which I have produc'd in a former work (*i*), and those of Valsalva, that I have refer'd to (*k*), there are so many others over and above, that I believe it is scarcely possible for me to enumerate them all. Let it be sufficient therefore, to have added some to those formerly taken notice of. Lælius a Fonte (*l*) says, that in the body of a bishop, who was an old man, "the gall-bladder was found full of light stones, and yet that he had never been at-

(*b*) N. 27.

(*i*) Epist. anat. 1. n. 50. 51.

(*k*) Supra n. 27.

(*l*) Consult med. 139. in fin.

"tack'd with a jaundice." Pechlinus (*m*) testifies the very same thing of an old woman, and of a woman who was publicly executed at Leipsic, Etmüller (*n*), as she had "in her gall-bladder, great plenty of large, and small stones," and our Vallisneri (*o*), asserts that he had, at one time, found many bilious calculi, and, at another, one large calculus, in the carcases of many persons who had "never" been affected with a jaundice.

How many cystic calculi Bæumlinus (*p*) found in that woman, in whom "any thing icteric" had not appear'd; how many Fabricius (*q*), in a woman who "in all appearance was healthy;" and, finally, how many Haller (*r*) found in another, who seem'd to be "very healthy," and, likewise, in an old woman, in whom were "no signs of jaundice," you may yourself see: nor indeed will you suspect, I suppose, that in a great number of other histories, given by this author, wherein there is no mention of the jaundice, this disorder, probably, might not have been wanting, when you observe that, where he collects the substance of them together, he says, these calculi "were, for the most part, unattended with a jaundice, as was certain from his own experience (*s*)."

Others, and among these Vaterus (*t*), I purposely pass over, since to the authors that I have nam'd, it is necessary not only to add those whom I shall presently (*u*) bring to bear witness, that they had seen no kind of disorder whatever, join'd with these calculi, but those also who, in describing, or making mention of, other symptoms, or disorders, of persons in whom were cystic calculi, have pass'd over the jaundice entirely, though a disorder that must have occur'd to their eyes, even in spite of themselves: and in the number of these do not imagine there are only Reverhorst (*x*), Contulus (*y*), Riedlinus (*z*), Hoffmann (*a*), Bassius (*b*), and others of the more modern. Do but turn to the Sepulchretum. You will find Bonetus (*c*), Morton (*d*), Greifeliuss (*e*), Kentmannus (*f*), Hülstedreichius (*g*), Cnoffelius (*h*), and others; for I have not time to refer you to every one of them, in particular, in reading of whose histories I could not suffer myself to suppose, that they would so readily have pass'd over the jaundice, if their patients had been affected therewith.

32. How is it then, you will say, that there are so many witnesses on the other hand, and produc'd even in the Sepulchretum itself, that have seen this disorder join'd with cystic calculi? Not for this reason, certainly, that if these are suppos'd to exist, the other must necessarily be suppos'd to exist also. For if so, this disorder must have been seen attending upon those calculi by all. It must therefore be for some other reason. Thus, for the sake of ex-

(*m*) Apud Scheffel. diff. cit. supra ad n. 13.
§. 16.

(*n*) Prax. l. 1. f. 17. c. 3. art. 4.

(*o*) Adnot. cit. supra ad n. 13.

(*p*)

(*q*) Loc. indic. supra ad n. 23.

(*r*) Opusc. pathol. obs. 33. hist. 7. & 11.

(*s*) Ibid. hist. 10.

(*t*) Diff. supra ad n. 16. cit. thes. 9.

(*u*) N. 38 & seq.

(*x*) Diff. supra cit. ad n. 16.

(*y*) Loc. supra ad n. 23. cit. c. 25.

(*z*) Eph. n. c. cent. 3. obs. 45.

(*a*) Cap. supra ad n. 15. cit. obs. 1.

(*b*) Dec. 4. obs. anat. 9.

(*c*) L. 2. f. 4. obs. 35.

(*d*) S. 7. obs. 43.

(*e*) S. 11. obs. 46.

(*f*) L. 3. f. 7. obs. 33.

(*g*) S. 14. obs. 36.

(*h*) S. 17. obs. 14. §. 5.

ample, and not to depart from the Sepulchretum, you have in the observation of Helwigius (*i*), a jaundice with these calculi, and with a liver, at the same time, lank, shrivel'd and putrescent: you have them also in the observations of Vesalius (*k*), and Verzascha (*l*); but then you have also, at the same time, a liver that was enlarg'd, hard and green, or scirrhus, yellow, and pallid.

There is, at one time, instead of this kind of diseases another disease, as when Beckerus (*m*) describes calculi, found not only in the gall-bladder, but in the pori choledoci, in like manner. And at other times there are both of them. Thus Deodatus (*n*), and Dobrzenskius (*o*), relate that there was an indurated liver, at the same time that there were calculi, both in the cyst, and in those ducts. And it is not surprizing, that the matter of the bile should remain in the blood, and produce the regius morbus, when the liver can neither secrete it, nor discharge, from its own substance, that which is secreted, without preventing the secretion of the rest. And that to this class also, the old observation (*p*) ought to be refer'd, which was taken from the mother of a professor at Bologna, you would readily perceive, if the whole of it were produc'd.

You however must read this, as you will that of Vesalius which I just now pointed out, twice over in one and the same section; for it is that very observation (who would at first believe it) which is produc'd even below (*q*): as you will easily find out by comparing one with another, and by comparing them both with that which had been given in another section (*r*), or rather with the passages of Coiterus (*s*) relative to this subject, who is the author that took the observation; for although it is so many times repeated in the Sepulchretum, yet the doubt of the author is always neglected, which for many reasons ought not to have been omitted; for he did not say "she had labour'd under the jaundice" but "she had, if I am not mistaken, labour'd under the jaundice."

You see, therefore, that the testimonies produc'd are weaken'd, if any one attends to them rightly, and that their number is, at the same time, diminish'd, when it is demonstrated that one single testimony is produc'd twice over, as if it had been a double attestation. Thus you will also find the observation of Timæus (*t*) repeated, just as you will that of Guarinoni (*u*), and others perhaps: but in none will you be more surpriz'd, than in that of Fontanus (*x*), which, having been just before given under number twenty-two, is immediately given over again in every sense, and effect, and indeed almost in the same words, under number twenty-three.

Yet the two last observations relate to quite another class, than that of cystic calculi being join'd with the jaundice indeed, but, at the same time, with either a considerable disorder of the liver, or an obstruction of the bi-

(*i*) Ibid. f. 7. in additam. obf. 1.

(*k*) S. 18. obf. 8. §. 4. cum obf. 20.

(*l*) Ibid. in addit. obf. 6.

(*m*) Sect. ead. obf. 8. §. 1.

(*n*) Ibid. §. 10.

(*o*) S. 16. obf. 5.

(*p*) S. 18. obf. 8. §. 5.

(*q*) Ibid. obf. 25. §. 6.

(*r*) S. 8. obf. 36.

(*s*) Obf. anat.

(*t*) S. 18. obf. 8. §. 11. & obf. 25. §. 4.

(*u*) Ibid. obf. 33. & in additam. obf. 5.

(*x*) Sect. ead.

liary canals, to which the two former, and some others much more recently publish'd, belong. And one of these, if it be produc'd, may easily have its testimony lessen'd in a different manner; as when Vaterus (y) says that a matron, in whose cyst he found thirty calculi, had labour'd under the jaundice. For this we confess; but we at the same time attend to what he immediately subjoins, that being freed from the jaundice, she had liv'd about three and twenty years in a state of perfect health, and was at length carried off by an apoplexy. For if she had been attack'd with the jaundice, merely as the effect of calculi, lying hid in the gall-bladder at that time, she would not have pass'd so long a space of time as three and twenty years, during which the calculi not only exist'd, but were even increas'd, without being troubled with the jaundice.

And an answer of the same kind you will naturally give to them also, who would object the observations of Weitbrecht (z), and Galeati (a). For both of them found calculi in the gall-bladder after a jaundice which had long preceded: although you may also give this answer, that by the first the liver was found to be somewhat hard, at the same time; that by the second it was found to be considerably hard, and crowded with a great number of tubercles; to say nothing of those things that I hinted at above (b), from whence you may perceive, that different calculi may have been formerly in different situations, so as easily to prevent the bile from flowing into the intestines at that time.

But if any one should oppose to these examples, others, in which not only a preceding jaundice, but a present one, was join'd with cystic calculi, as those of Lanzonus (c), du Verney (d), Van Swieten (e), Haller (f), and other celebrated men, you have wherewithal sufficiently to reply, from what has been just now said. For the first saw the liver, at the same time, "beset with a great number of hydatids;" the second so dried up, in one half of its substance, that it did not equal the thickness of a thumb, the third, "pallid, hard, without moisture, and rough with scirrhus tumours;" and the fourth, finally, although in so many histories he only exhibits two of icteric bodies, the second, and the ninth, yet in the former describes the same viscus as being "diseas'd, and ulcerous," and in the latter, as being "in great measure putrid, the gall-bladder being wholly consum'd, so that the calculus was found in the midst of a putrid jelly as it were." And I suspect that if other observations, of some authors, that are produc'd, had not been made hastily, and by-the-by as it were, but had been taken, and communicated to the public, with great accuracy, it would have happen'd frequently, that we should read of other marks of disease being found in the neighbouring parts, and particularly in the liver, within which, unless you search after them, they may even lie hid.

Observations that are still less recent, are sometimes produc'd likewise; but to confess the truth, to very little effect, as, for instance, that of our Domi-

(y) Thes. 9. cit. supra ad n. 31.

(z) Cit. supra ad n. 17.

(a) Cit. supra ad n. 24.

(b) Ibid.

(c) Eph. n. c. dec. 3. a. 3. obs. 36.

(d) Cit. supra ad n. 13.

(e) Ad §. 950. cit. supra ad n. 15.

(f) Opusc. pathol. obs. 33.

nic de Marchettis (*g*), as if he had said that he had seen a jaundice from cystic calculi. But he, when he says "the vesicle being obstructed by any matter, or by a stone, (for I have sometimes found in this vesicle, three or four stones of the bigness of a vetch) a yellow jaundice is brought on;" says, indeed, that stones had been found there by him; but that he had found them in such a situation as to obstruct the meatus of the vesicle, and for that reason bring on jaundice, he certainly does not say.

33. But setting aside all these, and other similar observations, on account of those animadversions which I have hitherto hinted at, as some still remain to which none of these objections can, perhaps, be made, you will enquire of me, in what manner calculi of the gall-bladder may, sometimes, bring on a jaundice in human bodies, and whether in that manner which Marchettus and others have imagin'd, if they obstruct the vesicle, or rather the duct which is proper to it, that is the cystic duct.

For that the cyst has been obstructed without a jaundice, is certain even from the observations which I took notice of above (*b*) for instance, when it was full of stones. And altho' when it is full of these it can discharge no bile, and consequently it comes just to the same thing, as if the meatus were really shut up; yet to satisfy you I will produce, below (*i*), observations of that meatus being stop'd up, without a jaundice; but here I will only call to mind what is demonstrat'd above (*k*), that it is not through the ductus cysticus, but through the hepaticus, and communis, that bile is sent from the liver to the intestines; so that unless these passages be obstructed, either by an excrescence, or by some constriction, or by a viscid, and thick matter, or by calculi, generated either in these passages, or in the liver, or even in the cyst, but push'd down into these passages, the bile cannot be retain'd in the liver, on account of the biliary passages; and therefore the matter, by which this fluid is constantly supplied, cannot be retain'd in the sanguiferous vessels, in order to bring on a jaundice.

Yet we must be cautious, lest at any time we fall into errors, in regard to the words which are us'd by ancient observers, to signify the ductus hepaticus, or communis, and suppose them to mean the cystic duct instead of the other. For they, according to the tenor of the opinions of their times, took either one or the other of these ducts for the meatus of the cyst, as I have even shown before (*l*), in explaining a passage of Fernelius; and the cystic duct, as you may see in Mundinus (*m*), they call'd by the name of *collum vesiculæ* or neck of the gall-bladder, and not by the name of pore, meatus, or duct.

Therefore, when you read in Donatus (*n*), of Albucaſis having taught, and Nicolus having confirm'd, "that a fleshy excrescence arises in the meatus of the gall-bladder, which, by stopping it up, is the cause of an incurable jaundice," although I have said (*o*) that this has even been found by me formerly, in the vesicle itself, yet do not be hasty to believe that the excrescence, of which they speak, was suppos'd, by them, to be form'd in this

(*g*) Anat. c. 4.

(*b*) N. 31.

(*i*) N. 39.

(*k*) N. 10.

(*l*) N. 27.

(*m*) Anat. ubi de kyſti ſell.

(*n*) De med. hiſt. mirab. l. 5. c. 3.

(*o*) Supra n. 20.

vesicle, or in the cystic duct, inasmuch as it must have stopp'd up some other passage besides this, in order to have been the real cause of a jaundice.

Thus when Gentilis, as is hinted at above (*p*), has asserted that he had found a stone "in the pore, or meatus, of the gall-bladder;" you must consider what you are to understand thereby. The very reading of the Sepulchretum will render you cautious in this respect, where Camericius (*q*) writes thus to Mathiolus: "the meatus which goes from the gall-bladder, "into the liver, was quite free and open," that is the hepatic duct. And he had said a little before, "the meatus going from the gall-bladder, and "terminating in the intestine, was obstructed by a stone:" and that this was not the ductus cysticus, but the communis, you may be assur'd not only from what has been said, but also from this circumstance, that in the icteric body in question, "the gall-bladder was extremely full of bile."

Nor will you understand differently, these words in the observation of Coiterus (*r*), "in the passage from the gall-bladder, to the duodendum, "was a large calculus, which totally obstructed that passage, on all sides," especially when you observe that the folliculus fellis is so describ'd by himself (*s*), in another place, that without making any mention of the cystic duct, he says "it is provided with two pores, or passages, one by which "it draws bile from the liver, the other by which it transmits the bile, "from itself, into the intestinum duodendum." For there is no doubt but he has follow'd the dogmas of his preceptor Fallopius (*t*), in that point, so as to consider the ductus cysticus in the manner the ancients did, that is as the neck of the bladder; yet not so far as to acknowledge, that the bile was carried from the liver, to the intestine, by one meatus, and that a strait one, "on which meatus, about the middle of its course, nature has planted a "bladder with its neck."

34. It is not the cystic duct, therefore, but the hepatic, which (for though we acknowledge it to be one, yet for the sake of custom, and more clear doctrine only, we divide it into the hepaticus and communis) I say it is not the cystic, but the hepatic, which we require to be obstructed, either by an excrescence, or by a calculus, which has even been frequently observ'd there by Fallopius (*u*), or by a thick and viscid matter, in some other manner, in order to make us confess, that the jaundice has arisen from the disorder of the more considerable passages of the bile. For that they may be obstructed, not only by viscid, or thick matter, but even by the bile itself, I do not doubt, as I formerly found, in a dog that had been much disorder'd, the extremity not only of the pancreatic duct, but, also, of the ductus communis, shut up by means of a kind of gypseous, and yellowish matter, concreted there: and we read Etmuller (*x*) describing, in an icteric body at Leipzig, "the lower pore, "or meatus, entirely obstructed by a viscid pituita, so that after cutting away "this biliary meatus, not so much as a drop of bile flow'd out, because the "bile, which was contain'd there, was very thick, and tenacious.

(*p*) N. 15.

(*q*) L. 3. f. 18. obs. 8. §. 12.

(*r*) Ibid. f. 8. obs. 36.

(*s*) Tab. intern. hum. corp. part.

(*t*) Obs. anat.

(*u*) Ibid.

(*x*) Art. supra cit. ad n. 31.

But I know that you may take occasion to interrupt me here, and enquire why then the noble Frenchman, whom Scultetus (*y*) dissected, as he had “the porus biliaris, in that part where it is inserted into the duodenum, so far obstructed with a stone, equal to a large pea in its size, that not the least quantity of bile could be thrown out thereby,” had not, nevertheless, been affected with a jaundice? And in so singular a case, unless I should choose to have recourse to those constitutions of the blood (*z*), in which the matter that supplies the bile, and even the bile itself, can scarcely give any tinge of yellowness, I am under a necessity of supposing that there was some peculiar disposition of the biliary passages: such, for instance, as Fallopius (*a*) asserts had been seen by him, two or three times, that is to say, the ductus communis “divided into a double canal,” a little above the intestinum duodenum: which division, but betwixt the coats of the same intestine, “into two considerable branches, that open’d by separate orifices, within the intestine,” was once seen, likewise, by Abraham Vater (*b*).

For supposing one of these orifices to be obstructed, a passage still remains open through the other, for the bile to go to the intestines. There also might be some other more uncommon duct, like that which Vesslingius found, and was examin’d by Bartholin (*c*), in a woman “of a good habit, fat, and pretty healthy,” when the cyst was stuff’d up, and obstructed, by calculi, and which “went from the liver, in the neighbourhood even of the porus biliaris, that was fill’d up with calculi, and terminated in the intestinum jejunum,” or that which Bezoldus describes, as being seen by him (*d*), and which, according to the figure he gives of it, is very similar to that of Vesslingius, provided it did not go to the ductus communis, but to the intestines, or those that the same author takes notice of (*e*) as having been demonstrated by Diemerbroeck, which were produc’d, separately from the ductus communis, betwixt the vesicle and the intestines, so that a great part of the bile might either be carried immediately to the intestines, in a direct passage, or through the more general passage of the ductus communis.

But as to the observations of Andreas a Lacuna, which he immediately subjoins, and which, in part, relate to those observations that I have refer’d to above (*f*), of stones being form’d, by concretion, in the cyst, without a jaundice, and, on that account, produc’d in the first of the *Epistolæ Anatomicæ* (*g*), if he could have read them rather in the words of the author himself, than in those of Riolanus, he would have chosen to make use of the words of the former, in preference to those of the latter, inasmuch as Riolanus, by a slip of his memory, has related three things in three lines, that by no means agree with those which Andreas had said. But let us omit these considerations, and go on to others.

35. As I advanc’d four kinds of causes above (*b*), by which the common, or

(*y*) Obs. cit. supra ad n. 18.

(*z*) Vid. supra n. 9.

(*a*) Obs. cit.

(*b*) Dissert. qua novum bilis diverticulum

&c. thes. 7.

(*c*) Cent. 2. hist. anat. 54.

(*d*) Diss. de cholelitho §. 6. & fig. 1. litt. f.

(*e*) §. cit.

(*f*) N. 31.

(*g*) N. 50.

(*b*) N. 33.

hepatic, canal may be obstructed, but produc'd examples of three only, you may perhaps wonder why I have produc'd no observation of the fourth, that is of constriction. But you will cease to wonder, when, in reading over again the present very prolix letter, you observe this to have been done already (*i*), as far as was possible, by examples pointed out from the Sepulchretum. But if you inquire after other instances, from different authors, they are by no means wanting. That is a very famous one, by reason of the eminence of the patient, which was taken from Andrew Mauroceni, a noble Venetian, who was illustrious both as a senator, and as an historian, and which is given us by his learned physician Aurelio Palazzoli (*k*). For the cause of the jaundice, of which Mauroceni died, was an insuperable constriction of the passages; inasmuch as "the duct by which the bile is, chiefly, carried to the intestines, had become callous."

Mead (*l*), also in a body that had been troubled with an obstinate jaundice, saw the same meatus, where it makes a coalition with the cystic duct, so contracted, as if a ligature had been made upon it, that "it would not admit a probe;" nor could any portion of the bile, with which the gall-bladder and liver were distended, pass on, by this way, to the intestines: and this contraction seem'd to have been brought on by a scirrhus, and even a cancerous, tumour of the neighbouring pancreas. And in the acts of the Cæsarean Academy (*m*), an observation is extant of an icteric body, in which, by reason of a scirrhus pancreas, the same common canal was shut up at its termination, not without "a firm concretion."

Examples of the more rare causes therefore, which, either by condensing the tube into a solid body, or by pressing upon it externally, constrict the common duct of the bile, I have neither been backward to produce above, nor in this place, and should do the same in regard to the more frequent causes of constriction, if the effects of these were as easily observ'd by the senses, after death, as they are probable from reason, and agreeable therewith. I speak of spasmodic *crispatures*, by which, at least, the orifice of the common duct, or the greater part of the small branches of the hepatic, are constrict'd: unless we should suppose that the observation of the celebrated Jo. George Maurerus (*n*) relates to this subject.

An illustrious man, after a wound receiv'd in the region of the liver, which did not penetrate, being seiz'd with a bilious tertian fever, and a jaundice, and after that with other disorders, yet giving hopes of recovery, and in regard to the jaundice itself, being almost quite recover'd, but having a violent, repeated, and long uneasiness of mind come on, which a sudden inflammation of the fauces and lungs succeeded, not without "fears, and anxieties, about approaching death," really underwent this change, in the space of three days. And he had, to omit other things, within the cyst, three calculi of a considerable size, but "the orifice of the ductus choledocus, and the whole of this canal, was so far obliterated, or constricted, that it would not allow the least probe, or bodkin, to pass, and much less any drops of bile."

(*i*) N. 10.

(*k*) Vid. in adnot. a Cathar. Zeno additis vitam hujus Mauroceni ab Nic. Craffo scriptam.

(*l*) Monit. med. c. 9. f. 1.

(*m*) Tom. 8. obs. 30.

(*n*) Ibid. obs. 70.

There is no doubt but the cavity of this duct was so constricted, when the skin was yellow, and the intestinal fæces “were white,” and discharg’d “slowly and difficultly.” But it certainly was no longer in that constricted state, at the time when the skin was restor’d “to a quite natural and florid colour,” and the fæces were discharg’d “in a great quantity, and ting’d as they naturally are. It may, therefore, seem not absurd to suppose that a spasmodic constriction, which a quiet state of the mind, and a proper regimen of cure, had lately relax’d, return’d, within those three days, from new commotions of that kind, together with the whole train of deadly symptoms.

But be this as it will, if you, in the mean time, acknowledge what I have said of crispatures, which are brought on by a spasm, in consequence of certain passions of the mind, or excited by irritations, and pains, of various parts (*o*), but particularly of those that are the most near to the liver; I say, if you acknowledge these things to agree with probability, and attend a little to what relates to irritations, you will, doubtless, find out the reason which you ask’d of me (*p*), why, supposing calculi in the gall-bladder, the jaundice may sometimes arise, although there be no other cause, at the same time, of all those which I mention’d above, from whence this disorder could be accounted for.

This was formerly allow’d by me, when I said (*q*) “whether the calculi found by me, were not yet of that magnitude, or weight, or figure, by which the cyst could be much injur’d, or whether they were never driven into such a situation, as to have in their power to obstruct the bile,” it might have been for these reasons, that in those bodies, wherein I found them, “they had brought on no peculiar disorder, or, at least, none that was evident, and indeed not so much as an icteric colour.”

For I did not doubt, but if the cyst were irritated, either by the magnitude, or the weight, or, in particular, by the figure of the calculi, and chiefly when they are forc’d into the streights of the neck of the bladder, by the bile which they thus retain therein; and at the time when this cyst is compress’d by the stomach, and intestines, forc’d on still farther and farther, that a spasm may then arise, with contractions, and crispatures, which are propagated through the larger and continu’d ducts of the bile, on the one hand, to the intestinum duodenum, and on the other, to the liver: and I did not doubt but that the passages being thus contracted, a jaundice might be form’d, in the manner afterwards particularly explain’d by Hoffmann (*r*). Therefore the jaundice, as it can then only be the consequence of gall-stones, and as what these then do by irritating, may be done, at other times, by different causes in different situations, and even by the passions of the mind themselves, this will, therefore, not be the constant, and proper, sign of these cystic concretions.

36. And if the jaundice is not a constant sign, is there any other that is perpetual, and peculiar? I very much fear lest that, which was the case in the time of Fernelius (*s*), is also the case at present, and will be so, for the future; I mean that “no manifest marks, by which the existence of these stones may, certainly, and easily be known,” can be found out, but that

(*o*) Supra n. 10.

(*p*) N. 33.

(*q*) Epist. anat. I. n. 50.

(*r*) C. 3. supra ad n. 15. cit. §. 19. & p. 4.

f. 12. c. 12. §. 10.

(*s*) C. 5. supra ad n. 13 & 27. cit.

we must dwell upon "suspensions" only, as we have seen of the jaundice. It does not, however, escape me, that there have been celebrated men, both among the ancients, and moderns, who have attended to these marks with a very laudable industry, and have endeavour'd to approve them to every one.

For, in the first place, I see that Coiterus (*t*), has publish'd some observations of his own, of these calculi, with an intention "that therefrom might be learn'd the symptoms, which are the consequences of this disorder." But these are reduc'd to a long-contin'd jaundice, and in one, wherein even the common canal was obstructed, to a continual vomiting of food. In regard to the first of which I have said enough already. And in regard to the second, which is likewise taken notice of by others, how often it is absent, and by how many, and how various causes, besides this, it may be brought on, is certainly manifest to every one.

Others have since added different symptoms, the consideration of which I shall not particularly prosecute, as it naturally appears, that the same thing must be said of colic pains, and other symptoms of that kind, which I have already said of vomiting. And what shall we say, when we see such symptoms advanc'd, as are diametrically opposite to each other, as for instance, those of costiveness, and laxity of the intestines? Nor does it affect me, to find it asserted in the Sepulchretum (*u*), that "it is scarcely possible to conceive" of this latter symptom taking place: for it is very clear to me, that when the vesicle is entirely fill'd up by a calculus, all the bile must, of course; flow continually to the intestines, and if it be acrid in any considerable degree, must, of course, stimulate them pretty strongly. But I only remark this circumstance, that if sometimes one, and sometimes the other, is true, which I do not doubt, neither of them, consequently, can be the perpetual, and peculiar symptom, of these calculi.

37. But if we omit these symptoms which are common to other disorders, and enquire what the calculus can of itself effect, we shall come back nearly to those things, which, as I have just now taken notice (*x*), have been already said by me in the first anatomical epistle. "The calculus, of itself," as Boerhaave also says (*y*), "while it remains quiet, produces no disagreeable symptom, except a sense of weight, but irritates by its bulk, its weight, and its roughness." If we transfer these things, which he says of the urinary bladder, to the gall-bladder, do you suppose that this calculus, which is lighter than that of the urinary bladder, and is gradually increas'd, will discover itself to exist by a sense of weight? We must wait a long time then, till it, at length, acquires a greater weight. But will the sign, which we shall be in want of so long, and in most cases always, be then, at length, sensible at least, and plac'd beyond a doubt. It was certainly sensible in the noble count of whom Hildanus speaks (*z*), since, "for many years, as often as he turn'd himself from one side to the other in bed, he could perceive a great, and troublesome weight, opposite to the liver, that fell from one side to the other."

(*t*) Obs. anat.

(*u*) L. 3. f. 10. additam. in schol. ad obs. 1.

(*x*) N. 35.

(*y*) Prælect. ad instit. §. 790.

(*z*) Obs. supra cit. ad n. 22.

But the calculi, contain'd in his gall-bladder, were so large as to weigh eighteen drachms and a half, and that when in a dried state, for when recent from the body, they were much heavier. But do you suppose these to have been heavier than that great number of calculi, which were found, at one time, by Greifelius (*a*), all of which, taken together, weigh'd thirty drachms? For he has not remark'd that the man, in whose body he found them, had ever perceiv'd any weight therefrom.

Yet perhaps you will say, that the vast quantity of fat, which was found in his belly, might possibly obtund this sensation. Were all the bodies extremely fat then, in which these calculi have been found to a considerable weight? At least the woman (*b*), in whom the calculi were equal to the weight of twenty-four drachms, does not seem to have been very fat, nor yet the priest (*c*), whose calculi weigh'd twenty drachms, nor the illustrious man (*d*), in whom they weigh'd almost as much. Yet we read of none of these, what Hildanus asserts of the count, when he turn'd himself in bed, nor do I ever remember to have read the same of any person, whose gall-bladder was loaded with calculi. To this case of the count, I should suppose, from comparing the times together, Stieberus (*e*) refer'd, when to an observation of that kind, he objected another "of more than two hundred stones," in the gall-bladder of a man, "who had never made any complaint of an oppressive pain " in the right side."

But suppose that many have complain'd of that same sensation, of which the count above-mention'd complain'd. Yet at the same time call to mind those facculi, which hung from the liver, and were loaded with calculi (*f*), or call to mind even the gall-bladder itself, which has been found more than once to be distended with a large quantity of thick bile, to a surprizing degree. You will, by this reflexion, clearly perceive, that the same sensation may sometimes arise from other causes, besides calculi, or if it arises from calculi, not only from those which the gall-bladder contains. And it is manifest from these, and other examples, that even the distention, which not only the patient, but the physician, also, by applying his hand to the part, perceives, and, consequently, the effect of the bulk of calculi, affords but an ambiguous mark of their existence.

The roughness remains. Of which I say first, as I have already said of the weight, and might have said of the bulk, that it is not always such as can irritate, and discover itself by irritation. And, in the second place, I say, that even when it is of such a kind, the vesicle is, at one time, defended by the quantity, and at another time by the thickness of the bile, from the irritation it has a tendency to create; for that happens very rarely here, which happens almost always in the urinary bladder, that all the contain'd humour being discharg'd, nothing remains but the calculus, by which the bladder is prick'd, and stimulated, especially as the gall-bladder cannot contract itself like the other, and closely embrace the stone: and although this could hap-

(*a*) Obf. supra cit. ad n. 19.

(*b*) Eph. n. c. dec. 3. a 7 & 8. obf. 123.

(*c*) Act. n. c. tom. 5. obf. 129.

(*d*) Commerc. litter. a. 1742. hebdom. 28.

(*e*) Sepulchr. l. 3. f. 17. obf. 14. §. 3. cum schol.

(*f*) Vid. supra n. 13.

pen, yet the sense of both bladders does not seem equally exquisite; and this I say, lest you should have recourse to the turgescentcy of the stomach, and intestines, which, however, does not always subsist, in order to make us conceive how the cyst may be press'd close upon the calculus.

Finally, I say that in these very viscera, in the part where they can press upon the contiguous vesicle, that same sense of pricking may happen to exist from another cause, which would be, in the gall-bladder, from a calculus; and even that it may be in this vesicle itself, from the very acrid quality of retained bile, or from some spasm; so that irritations may be either suppos'd to exist in this receptacle, which are not there, or those which are there, may arise from a cause quite different from calculi.

38. What I have said on both sides of the question then, hitherto, goes so far as to give you to understand, that there is no perpetual, no peculiar, sign of these calculi. But lest you should chance to suspect, that there may be some fallacy in reasoning, as there often is, let us confine ourselves to experience. I set aside all my own observations, and those of Valsalva (*g*), in none of which there was any sign of those calculi, that we, nevertheless, found in the gall-bladder. I also set aside those which I have produc'd in a former work (*b*), from Gerbesius, and Lospicklerus, who assert of men troubled with calculi of the gall-bladder, "that they had liv'd a long time in health, " and had been free from complaints."

But if others testify the same thing besides, is it but just that you should call to mind, all those observations which we now set aside. Rolsinc (*i*), therefore, a physician of great eminence in his times, when he describes what kind of calculi he found in the cyst, says, in general, "that stones of the gall-bladder very often lie latent in that cyst, for some years, without doing any injury, sometimes bringing on pain, and sometimes being without. L'E-mery the father (*k*), affirms it to be well known, that these stones not only do not cause death, but even "frequently cause no inconvenience whatever." And I have already said above (*l*), that Vaterus had observ'd in a woman, who had thirty of them in the gall-bladder, a long-continu'd, and "perfect health," even to the end of her life.

Galeati (*m*), in like manner, affirms, that in a woman, whose body he dissected, "nothing had happen'd, either in the disease whereof she died," (which was a dropfy) "nor before that time, as far as he could learn, that "show'd the gall-bladder to be affected;" yet in this vesicle, nevertheless, were four calculi, the largest of which "being angular, had obstructed the orifice of the cystic canal." Themelius (*n*), also, when he takes notice of "some biliary calculi, worthy of remark," that were found by him, in the cyst of a strumpet, expressly says, "that they had not been attended with any injury to health."

Finally, Roncallus (*o*), for I am not willing to mention any more here, than naturally occur to me as I write; gives an account of seven calculi, of

(*g*) Vid. supra n. 27.

(*b*) Epist. anat. 1. n. 51.

(*i*) Dissert. de gutta ser. corollar. 4.

(*k*) Hist. de l'acad. r. des sc. a. 1703. obs. anat. 1.

(*l*) N. 32.

(*m*) Cit. supra ad n. 21.

(*n*) Act. n. c. tom. 5. obs. 10. prop. fin.

(*o*) In epist. addit. ad hist. morbor.

the size of a small walnut, being found, by him, in the gall-bladder of a woman, who died in the eighth month of her pregnancy, and who, in the whole of that time, and long before, “had been endow’d with a very good habit of body, was well nourish’d, and had a good colour;” so that it was manifest, unless these concretions had been form’d in an instant of time, which cannot be suppos’d, “that health may continue,” even when these are present.

If am not by any means deceiv’d then, it is sufficiently demonstrated, that there is no perpetual sign of cystic calculi, and, consequently, that there is none proper, and peculiar.

39. How is it then, you will say, that Wepfer (*p*), a very experienc’d physician, has written these things to Verzascha: “I do not think that the neck of the gall-bladder is stop’d up, because there is not the least complaint of a cardialgia, or pain with tension, near to the cartilago ensiformis, the seat of which might be cover’d with a silver penny?” Did not he, at least, think this an inseparable sign, where the calculus had stop’d up the neck of the gall-bladder?

But I would have you attend to this, that he has not made mention of calculi in particular, and that there are other causes besides a calculus (*q*), which are capable of obstructing the cystic duct, as well as the other biliary ducts. And in the second place, even when a calculus obstructed this duct, Galeati, as was just now said, did not only not observe a jaundice, which alone was found to be absent, at that time, by Bezoldus (*r*), and was prov’d to be so, in many cases, by Pechlinus (*s*), but even remark’d that nothing was the consequence of it which could show the cyst to be affected: and the same remarks, nearly, were made by Reverhorst (*t*): and by Phil. Jac. Hartmann (*u*), in two bodies: nor has Haller (*x*) any thing contradictory thereto, in the dissection of three bodies: nor, finally, he who could have related with accuracy all the symptoms of a patient, I mean the celebrated Trew (*y*).

And although Tacconus (*z*) says, that very great pains, in the hypogastric region, had been join’d with a quartan fever, yet he not only says, that the jaundice had not attended, at the same time, but even that there had not been those pains which reach to the cartilago ensiformis, as he had expressly signified, in another woman, a little before, where he suppos’d the existence of calculi, in the ductus communis. You see therefore, that not even when the meatus cysticus is obstructed by a calculus, as it was in all the bodies I have refer’d to, is that pain, which has been describ’d by Wepfer, a constant and perpetual sign of its existence.

40. And although our original enquiry, here, was after the symptoms of a calculus, not only when thrust down into that passage, but, in general, when existing in the gall-bladder, yet it will not repent me, that I have examin’d whether the sign describ’d by Wepfer, be proper to a calculus, that is fallen

(*p*) Sepulchr. l. 3. f. 17. in schol. ad obs. 6. in additam.

(*q*) Vid. supra n. 33 & 34.

(*r*) Diff. de coelitho cas. 1. n. 6.

(*s*) Vid. act. erud. Lipf. a. 1691. m. maj. in recens. l. ejus 1. obs. 58.

(*t*) Diff. de mot. bil. §. 57.

(*u*) Eph. n. c. dec. 2. a. 5. obs. 72 & 77.

(*x*) Opusc. pathol. obs. 33. hist. 4. 13. 14.

(*y*) Commenc. litter. a. 1743. hebdom. 32. n. 3.

(*z*) Cit. supra ad n. 16.

down into the ductus communis, since it cannot be proper to that which remains in the vesicle, as was sufficiently demonstrated above (*a*), when I treated slightly of the sense of distention. For as to an observation occurring in the Sepulchretum (*b*), to which this title is prefix'd, "a pain about the cartilago ensiformis, from calculi in the stomach, and gall-bladder;" take care how you suppose that the observation corresponds with the title: for in reading over the case, you will find, indeed, that many calculi adher'd very closely to the fundus, and substance, of the stomach; but that there was any calculus in the gall-bladder, or in any other part, you will not find.

From this observation, therefore, you will rather learn, that it was not a proper symptom of calculi existing in the ductus communis, which shew'd calculi to be adhering to the stomach. And, indeed, if besides these, others had also existed in the ductus communis, yet there would be room for doubt, to which of these two kinds, this pain ought to be ascrib'd, just as when in a history of the same kind of pain, calculi are describ'd in that duct, and the liver is said, at the same time, to be almost full of deprav'd matter, and to have very considerable disorders, and in another, many tumours are said to have existed throughout the liver, and this meatus to have been much compress'd by one of them: although, if the compression, or obstruction, of the ductus communis be suppos'd, of itself, to bring on the cause of that pain, whereof I speak; it, of course, cannot be consider'd as the peculiar mark of stones sticking therein, as it is sufficiently shewn above (*c*), that this canal may be both compress'd, and obstructed, without calculi, and as nothing forbids us to imagine, that bile may be sometimes confin'd therein, in a very great quantity, and that it is sometimes naturally so acrid, or becomes so by stagnation, that it has a power to distend, and to stimulate, the canal in the same manner with calculi.

Do not imagine, however, that the industry and skill of those who enquire after truth, and endeavour to increase medical knowledge, are less esteem'd by me, than by the celebrated man, who proves the explication of the pain in question, by the firm connection of the ligamentum suspensorium of the liver, to the peritonæum, where it covers the ensiform cartilage: but influenc'd by the same love of, and desire after, truth, that influence me at present, he soon after subjoins the following words: "and not in calculous affections of the liver only, but in inflammations, or other tumours of the same viscus, which have their seats not far from the roots of this ligament, these things are proper to explain the various symptoms of this kind, that arise from thence, and, particularly, the pain of the cartilago mucronata, of which we speak, and which, in similar circumstances, is frequently found to attend inflammations of the liver."

41. And this symptom is not only common to other disorders that are taken notice of, whether they be seated on the outside of the liver, or within the liver, or in the ductus communis itself, but does not always occur, even at the time when there are stones in this duct. For all biliary calculi, whatever, that are discharg'd from the intestines, must, of necessity, have pass'd through the streights of this duct to the intestines: and yet, notwithstanding

(*a*) N. 37.

(*b*) L. 3. f. 7. obs. 32.

(*c*) N. 10 & 34.

so many observations are extant, of stones of this kind being discharg'd with the stools, how few are there in which we read, that a pain at the cartilago eniformis had preceded the discharge?

It does not, however, escape me, that all the stones, thus discharg'd, are not to be suppos'd to have come from the liver. And, indeed, I readily confess, that although from the time in which they first began to be observ'd, which was before Galen (*d*), to this very time, almost innumerable observations of these concretions have been collected by Donatus (*e*), by Schenck (*f*), by Rhodius (*g*), by Schroekius the father (*h*), and by others, it seems to me that many of them have been generated in the intestines, or the stomach, itself.

For that they may, also, be generated in the stomach, ancient examples prove, the first of which is related by Donatus (*i*), when my fellow-citizen. "Mr. Jo. Juliani, of Forli, sent a stone to Gentilis, which was thrown up "by vomiting, equal to the size of a nut, after a pain of the stomach, which "in its hardness exceeded that of gypsum, and was, in its shape, like that of "an egg:" and one similar to this, except that it did not exceed the size of a jubebe, was of a whitish colour, and not furnish'd with evident strata, I formerly saw in the place of my nativity, which a woman had thrown up by vomiting, in like manner, after long-continu'd pains of the stomach.

But though others have lately thought that they have prov'd them to be generated in the intestines, by examples which, perhaps, are not very proper for the purpose, to me that seems more suitable to the present occasion, which you will find in Ballonius (*k*), "of a stone in the intestines, which was "perforated so as to suffer the more liquid matter to pass through it;" for it seems to have been form'd, by degrees, of earthy, and viscid, particles adhering, round about, to the intestines: the other particles passing through the middle of it, and keeping the passage open.

Who will venture to deny, that stones which are the largest of all, and universally made up of one, and the same, matter of this kind, had not their first beginning in the intestines, as they certainly had their increase? And indeed although I read that some were of such a kind, either in their magnitude, or colour, or their figure, that any one might easily refer them to the class of cystic concretions, as, for instance (*l*), those which were "at one "time smaller, and at another time larger, than peas," or "than filberts, "those which were of a yellow colour," or "in great part yellow," those which were "triangular," or otherwise "angular;" and, finally, to comprehend many examples in one, "those which in their shape, colour, and magnitude, "were like to the seeds of melons;" yet I will readily omit all these, especially as the symptoms which had preceded, are either not related with the necessary accuracy, or not related at all.

I will go on to those which the authors who describe them, or other men of eminence, have consider'd, and not without reason, as cystic, or, at least,

(*d*) Vid. apud Schenck. obs. med. l. 3. ubi de intestin. lapid. obs. 1.

(*e*) Cap. supra ad n. 15. cit.

(*f*) Obs. 1. modo cit.

(*g*) Cent. 2. obs. med. 74.

(*h*) Obs. supra ad n. 24. cit.

(*i*) Cap. modo cit.

(*k*) L. 2. consil. med. 24.

(*l*) Vid. apud Schenck. obs. 1. modo cit.

biliary concretions. But Fernelius, whom I have mention'd in a former work (*m*), says no more than that he had found "after a long jaundice, succeeded by a diarrhoea, innumerable calculi of this nature, like peas, or barley-corns, to be discharg'd by most persons." Coiterus, in like manner (*n*), says that he knew a woman, "who was freed from a very troublesome, and long-contin'd jaundice, by a discharge of a calculus with her stools." That Solomon Alberti, "had often observ'd calculi to be discharg'd with the fæces, after a very long jaundice," I know very well from the celebrated Haller (*o*): but whether he said more than this I know not, inasmuch as I have not his second "oration," which he there quotes; not that which is among the three publish'd in the year 1585, but that which is with the four publish'd in 1590, for that that is what he refers to, I do not doubt, as I see it is entitiled in Linden (*p*), *de felle ad intestina restagnante*, &c.

I have said above (*), that Malpighi has asserted a stone to be discharg'd by a matron, "after great pains and a long jaundice." That Ruysch (*q*) preserv'd "a calculus, which came from the gall-bladder, and was discharg'd *per anum*," I have read, but not what symptoms had preceded the discharge. And others I purposely omit, who have either said no more than Ruysch, of what had preceded, or have not mention'd so many symptoms as Malpighi.

42. It is better, therefore, to pass over to those who have made mention of the seat of the pain which preceded. Hoffmann the father, as the son relates (*r*), has said that there had been "very acute pains of the right hypochondrium." Dillenius (*s*), that after pains which had, "for a very long time," occupied the same hypochondrium, "colico-nephritic pains had succeeded." Bartholin (*t*), from the observation of Tinctorius, "that there had been many complaints of a pain in the right side, which extended to the intestines." Lentilius (*u*), "a very great pain about the region of the liver, with a tumour; of which pain, however, the patient had already complain'd, for the space of ten years." Wolfstrigelius (*x*), who has spoken more fully on the subject than the others, that pains had, at several times, preceded, "which resembled colico-nephritic pains, and which, though they frequently grew milder, yet as often return'd with violence:" that upon a relapse into this disease, as frequently happens, "there was a pain of the loins, and a rending pain about the right hypochondrium, at the place where the ductus choledocus is inserted into the duodenum:" that the disease returning again, "there was a pain which, indeed, rather resembled a colic pain, as it was not felt about the loins, and right hypochondrium, but chiefly towards the navel."

In fine, our Valisneri (*y*), who prosecuted every inquiry, himself, with accuracy, having observ'd similar cases, first in the place of his nativity, and after that here at Padua also, has said nothing more in regard to pains, than

(*m*) Advers. 3. animad. 28.

(*n*) Obf. anat.

(*o*) Ad Boerhaav. prælect. §. 348. not. (m).

(*p*) Renovat. de script. med. l. 1.

(*) N. 23.

(*q*) Præf. ad thes. animal. 1.

(*r*) Medic. rat. t. 4. p. 2. f. 2. c. 3. in fin.

(*s*) Eph. n. c. dec. 3. a. 9. obf. 246.

(*t*) Cent. 4. hist. anat. 49.

(*u*) Eph. n. c. dec. 2. a. 7. obf. 136.

(*x*) Earund. dec. 1. a. 2. obf. 89.

(*y*) Epist. supra ad n. 13. cit.

“ that they had been very violent in the region of the liver, and had extended themselves towards the navel.” The cases propos’d by Vaterus (*z*), and still more by Bezoldus (*a*), I purposely pass over, on account of the magnitude of the calculi, which, though they certainly had their beginning in the gall-bladder, yet, as they might seem to have receiv’d their increase in the intestines, should have been then said to have come from thence, rather than from the common biliary canal. And Vaterus says that there had been “ very violent, and excruciating pains of the belly, which first occupied the region of the navel, and at length settled in the lumbar region.” And Bezoldus, that after the patients “ having been surprizingly harass’d for six years and more, with pains of the right hypochondrium,” a stone was at length discharg’d by the intestines, but “ not without griping pains.” You see then, that in all these observations, no pain is taken notice of, which had its seat about the ensiform cartilage.

Nor is any thing hinted in regard to such a pain, by the two Hoffmanns, Maurice, and Frederic. For the former (*b*), though it is true he mentions “ the anterior parts,” yet mentions them in such a manner, as to say that there had been “ a long-continu’d vellicating pain, with tension, under the right hypochondrium, which was troublesome towards the anterior parts.” And although the latter (*c*), besides “ an intolerable pain in the right side, and under the false ribs,” adds the following words; “ about the scrobiculus cordis was a violent oppressive pain, which even extended itself into the umbilical region;” yet the scrobiculus cordis does not comprehend the ensiform cartilage, or if you would have it comprehended in these words, you must then call to mind, that in this observation, the question is not of a “ calculus,” but of “ bilious fordes stopping up the ductus choledocus;” so that by this means those things might rather be confirm’d, which I have advanc’d above (*d*), in regard to the ambiguity that must be the consequence of this symptom, which is certainly, also, the consequence of other symptoms, in the next observation of Hoffmann (*e*).

However, in the last (*f*), where the question is of calculi obstructing that duct, he mentions “ an acute, and almost intolerable pain, deeply fix’d in the region of the liver, with pains of the intestines, which were troublesome now and then, and remitted at intervals.” Finally, turn to those things that are written by the very skilful archiater Van Swieten (*g*), where he tells us what he has observ’d to happen at this time; you will find not a word of pain at the ensiform cartilage. And as upon duly considering all the observations that I have produc’d, you will observe that the pain was never extended to that cartilage, but to the navel, or the umbilical region, more than once, if you should happen to prefer taking the explication, not from the intestinum jejunum, into which the duodenum is continu’d, but from that part of the ligamentum suspensorium of the liver which is better known to Eustachius (*b*), than to Reverhorst (*i*), and accompanies the umbilical

(*z*) Dissert. qua obs. rariss. calcul. obs. 3.

(*a*) Diss. de coelitho cas. 2.

(*b*) Eph. n. c. dec. 2. a. 7. obser. 244.

(*c*) Paulo antè cit. capite 3. obs. 4.

(*d*) N. 40.

(*e*) C. eod. 3. obs. 5.

(*f*) Ibid. obs. 6.

(*g*) Comment. supra ad n. 15. cit. §. 950.

(*b*) Tab. anat. 2. fig. 3 & 4.

(*i*) Diss. de motu bilis. fig. 1.

ligament, or even from this ligament itself, you are at the same freedom to do it for me, as from the other part of the ligamentum suspensorium, when the pain shall, at any time, extend itself to the ensiform cartilage, as has been observ'd by others.

43. If, therefore, biliary calculi, as has been demonstrat'd hitherto, and will be confirm'd presently (*k*), do not discover themselves, by any constant, and peculiar symptoms, even when they are so far from being in a state of rest, that they are endeavouring to procure a discharge for themselves, how much less will they be able to do that, when they are in a perfect state of rest, in their vesicle?

But you will say that the symptoms of calculi, inherent in the kidneys, and urinary bladder, also, are very frequently ambiguous, and yet not held in contempt by physicians, in so great an obscurity of things. Nor do I despise the symptoms that have been advanc'd, as marks of the existence of cystic calculi; but I complain (*l*) that they are more proper to make us suspect their existence, than to convince us that they actually do exist. Yet if we are to insist upon suspicions, I not only commend those who endeavour to add some weight to these suspicions, by increasing the number of the symptoms, but, amongst them, I also take the liberty to mention myself.

Therefore, although I know that stones of the cyst are not always join'd with bile, which resembles fordes, nor always with urinary calculi, yet I believe that the suspicion of Sylvius, which you even have in the Sepulchretum (*m*), is not altogether to be despis'd, who fears lest those that vomit bile of this kind, should have concretions in the gall-bladder; and that another suspicion of my own ought not to be concealed. For I having, besides those that I formerly mention'd (*n*), as seen by me, seen others also, and read of others, that have been subject to bilious, and urinary calculi, at the same time: and as in turning over the observations, which I have in part made use of in this letter, I met with a great number likewise; I easily perceiv'd that these things did not happen by chance. Of those who I have read were thus affected, I will not omit one, who deserves to be taken notice of, in preference to the rest, on account of his merits in the medical faculty, I mean Michael Mercati (*o*). This gentleman having died of nephritic tortures, and having two stones, of a considerable size, sticking in his ureters, and in his kidneys sixty-three, which were all pretty small, or some of them only, as his preceptor Cæsalpinus has written, large, had, also, in his gall-bladder (although, as they take notice, he had never been attack'd with the jaundice) six and thirty of an obscure colour, angular in their figure, and of the bigness of a vetch.

And who is there, that; reading these things of Mercati, and in that great number of observations moreover, that the bishop, mention'd by Lælius a Fonte (*p*), was wont frequently to labour under the stone of the kidneys, that the count of Hoechstetter (*q*) had a stone, and fabulous formations therein, that the cooper of Wepfer (*r*) had a small stone,

(*k*) N. 44. & seq.

(*l*) Vid. n. 36.

(*m*) L. 3. f. 18. obs. 9.

(*n*) Epißt. anat. 1. n. 48.

(*o*) Vid. ejus vitam & testimonia, metallothecæ ejusd. Vaticanæ præfixa.

(*p*) Conf. cit. supra ad n. 31.

(*q*) Caf. cit. supra ad n. 17.

(*r*) Hist. cit. supra ad n. 20.

in a papillary caruncle of one kidney, that the woman of Borrichius (*s*) had discharg'd calculi from both bladders, that another of Morton (*t*) had one kidney fill'd therewith, that the old man of Reverhorst (*u*) had the same in his kidneys, and urinary bladder; will not suspect the causes to be similar?

And lest you should be inclin'd to suppose that this happen'd only in old persons, take notice, I beg of you, that a virgin of eighteen years of age, spoken of by Bonetus (*x*), had a stone taken from her by the lithotomist, of the bigness of a goose's egg: add to this that Bergerus (*y*) had found calculi in both the bladders of a counsellor at law; Lancisi (*z*), also, in the kidney of that excellent man Horatio Albani, both a large stone, and many small ones; and, finally, that Hoffmann (*a*) found one, which was not small in its size, in the kidney of a gentleman, and one much larger in the urinary bladder.

For I shall, designedly, take no notice of a great number of other authors, and among these Jo. Bapt. Contulus (*b*), Christophor. Cunradus (*c*), Vitus Riedlinus (*d*), Tob. Ferd. Pauli (*e*), Jo. Caspar. Grimmus (*f*), Jo. Sebastian Albrechtus (*g*), Jo. Jacob. Trelyngius (*h*), Christoph. Jac. Trew (*i*), who observ'd the same in two bodies, Jo. Storck (*k*), and Isr. Cregutus (*l*): these, I say, and others (*m*), I shall omit; since besides Baglivi (*n*), who so far considers this as what generally happens, that he has enquir'd into the reason, "why, when there are calculi in the gall-bladder, they also are generated in the urinary bladder, and vice versa," the testimony of Abraham Vater alone (*o*) may pass for many, who expressly affirms, "that calculi have, beyond a doubt, been very frequently observ'd in the gall-bladder, in those who have, at the same time, labour'd under a calculus of the urinary passages."

Who then can read such testimonies, and attend to so many similar cases, without immediately conceiving with Vaterus, "that the causes" of both species of calculi are, in a great measure, "evidently common to each other?" And if you take this for granted, you will, doubtless, begin to think with me, that when to the other marks of bilious calculi, this also shall be added, that the patient is subject to calculi of the urinary passages, some weight will be given to the other suspicions; especially if, according to what has been observ'd above (*p*), this patient is neither an infant, nor a child, but is already in a middle age, or advanc'd in life: which remark, drawn from the age of the patient, may, if join'd with others, help us to distinguish intestinal calculi, that have been discharg'd by stool, from such as are generated in the liver.

Thus the celebrated Carlius (*q*), when he had not believ'd that a certain

(*s*) Vid. Bartholin. act. Hafn. vol. 5. obs.
65.

(*t*) Phthisiolog. l. 3. c. 14. hist. 5.

(*u*) Diff. supra ad n. 42. cit. §. 56.

(*x*) Sepulchr. l. 2. f. 4. obs. 35.

(*y*) Physiolog. l. 1. c. 14.

(*z*) Oper. tom. 2. diff. 10.

(*a*) Cap. 3. supra ad n. 42. cit. obs. 1.

(*b*) De lapid. c. 25.

(*c*) Eph. n. c. dec. 3. a. 9 & 10. in obs. 171.

(*d*) Eorund. cent. 3. obs. 45.

(*e*) Eorund. cent. 9. obs. 76.

(*f*) Act. n. c. tom. 1. obs. 20.

(*g*) Eorund. t. 4. obs. 49.

(*h*) Eorund. t. 5. obs. 129.

(*i*) Commmerc. litter. a. 1734. hebd. 6. n. 5.
& a. 1743. hebd. 32. n. 3.

(*k*) Commmerc. litter. a. 1735. hebd. 52. n. 4.

(*l*) Differt. de calc. in corp. hum. generat.
& c. §. 31. in fin.

(*m*) Vid. epist. 57. n. 12.

(*n*) De experim. circa bilem.

(*o*) Diff. cit. supra ad n. 16. thes. 8.

(*p*) N. 15.

(*q*) Commmerc. litter. a. 1731. specimen. 51.
n. 1.

calculus, which was reckon'd among cystic calculi, and which had been discharg'd among the fæces, by a boy of eighteen years of age, did really belong to that class, for this reason "in particular, because such an age does not naturally bring on a disposition of that kind" (and it certainly does not, except very rarely, which is one point, wherein bilious, and urinary, calculi do not agree with each other) knew afterwards, that the liver of this young man, who had died of a dysentery, was found to be as sound as that of the most "healthy young animal can be:" whereas the calculus "of two ounces and a half in weight," for such it was, though it might have receiv'd the greater part of its increase in the intestines, would, at least, have left some trace of its former residence, and passage, in the gall-bladder, and the ducts affix'd to the liver.

44. But although the marks of bilious calculi, which I have taken notice of, are, as appears from those things that I have hitherto said, as Hoffmann admonishes (*r*), "to be taken and consider'd collectively:" and as all these marks cannot exist in all persons, the greater part of them, at least, and among these the principal are to be attended to (by the principal, I mean those which are wont to be the more frequently observ'd, as, for instance, when stones descend into the ductus communis, there is certainly a pain seated on the right side, a jaundice, vomiting, anxiety, relapse; for so I have in general observ'd, in many of those observations that are pointed out above (*s*)) although, I say, we must proceed in the manner I have said, yet we ought never to forget, how easily a deception may happen.

For if you compare with the greater part, or the principal of these marks, these two observations of Hoffmann, which I even refer'd to before (*t*), you will find that my surmises are not without foundation. And you will perceive the same thing, when, after having said (*u*) "that there are some symptoms which prove the existence of calculi, in the biliary ducts, that are by no means fallacious," and enumerated the chief of them, he presently (*x*) produces the signs of a very large calculus, sticking in the gall-bladder; but especially, when he describes the symptoms (*y*) of a jaundice, which was not brought on by any calculus, but only by a spasmodic "stricture."

Yet it not uncommonly happens, that as in urinary calculi, so in biliary also, we have a mark of their existence which is much more to be depended upon than the others; I mean when any one of these concretions, or some fragment of them, at least, is discharg'd. And as this very sign, which is evident even from the natural light of reason, was mention'd by others before, and among these by Vaterus (*z*), but particularly, and fully, by Vallisneri (*a*), it may seem very surprising to any one, why it is omitted by Hoffmann, among those signs that are "by no means fallacious;" especially as, five years before, this very author had taught the following things (*b*),

(*r*) Cap. 3. supra ad, n. 43. cit. §. 15.

(*s*) N. 42.

(*t*) N. eod. id. est. obf. 4 & 5.

(*u*) Ejusd. tom. 4. p. 4. c. 12. §. 13.

(*x*) §. 17.

(*y*) Obf. 1.

(*z*) Diff. supra ad n. 16. cit. thes. 12.

(*a*) Epist. supra ad n. 13. cit. adnot. 1.

(*b*) Tom. 4. paulo ante cit. p. 2. c. 3. §. 18.

“ but among all these signs, which I have already admonish’d you of, there
 “ is none more certain, whereby to judge of violent affections proceeding
 “ from the biliary calculi, than the discharge thereof, together with the in-
 “ testinal fæces; and then, just as it happens, in the case of renal calculi,
 “ when they have been carried down from the ureters, into the bladder, all
 “ the pains, together with the other violent affections, instantly and totally
 “ cease, and expire, at least if you except the jaundice, which does not im-
 “ mediately, but gradually disappear.”

When, therefore, the signs of calculi having intruded themselves into the biliary ducts, and endeavouring to procure an exit for themselves into the intestinum duodenum, have preceded; if among the fæces discharg’d from the intestines, which ought then to be carefully wash’d by servants, and, according to the admonition of Vallisneri, pass’d through a kind of sieve, any biliary calculus be found, it is not to be doubted, but this sign must throw such a light upon the case, as could not be hop’d from so many other marks, that are, at best, but uncertain, and, in some measure, obscure.

45. But there is need of caution, lest we should happen, at any time, to take an intestinal calculus for a biliary one, or, that all the ambiguity of words may be avoided here, for an hepatic calculus, that is a stone which is generated in the canals of the liver, or its appendage the gall-bladder.

There is a certain observation in Hoffmann (c), of twenty stones being discharg’d by vomiting; in regard to which, although he did not think it altogether incredible, that they should have proceeded from the biliary ducts, he, nevertheless, rather suppos’d them “ to have been generated from the successive, and alternate, concretions of very viscid, and earthy bile, in the flexure “ of the intestinum duodenum itself:” for they were angular, and of a yellow colour inclining to green; and of such a magnitude, that without excruciating pains in the right side of the belly, none of which had preceded, it did not seem possible for them to have pass’d through the ductus communis.

Yet a jaundice had preceded the discharge of these stones, and “ immediately” after this discharge, which ought to seem very astonishing to those who attend to the exception of Hoffmann, just now mention’d (d), “ was remov’d.” If, therefore, as they prevented the passage of the bile into the duodenum by their obstruction, so the bile either naturally, or by stagnation, was made acrid, or these calculi had very acute angles, you readily perceive, that not only a jaundice, but pains in the right side also, and other symptoms that are the consequences of them, might have been previously caus’d by them, and even have been remov’d by their discharge.

But it is rather possible that these symptoms may be join’d together, than frequent: and no pains of the right side having preceded, in the observation in question, might have render’d the physician sufficiently cautious. The absence of which, or of the jaundice, and still more of both, ought in like manner to render him cautious, when calculi, which might otherwise seem to be cystic, are discharg’d from the intestines, as in those examples that will be immediately pointed out. And first, three calculi occur to my mind

(e) (f) (g), that were discharg'd in the manner I have mention'd ; of which, whether you attend to the globular, or oval figure, to the external, or internal colour, and some other circumstances, you certainly will not be forward to deny that they might be cystic calculi, particularly if you call to mind that some very similar have been, at times, found in the gall-bladder : yet when you read that there had been gripings and pains of the belly, but none in the right hypochondrium, and even that, in one instance, there were oppressive pains in the iliac region, you will believe that they were intestinal calculi, and that so much the more readily, as you will see that not a jaundice, but a volvulus, is taken notice of, in each of these three cases.

Three other instances succeed. In regard to the first of which (b), if it made any mention of the jaundice, and did not say that the stones were discharg'd "without any pains," their description would so much the more incline us to take them for cystic calculi ; as, in their size, they were by no means to be compar'd with those that are mention'd in the three former, and in as many subsequent, examples. The second of these (i) mentions colic pains indeed ; but not in the right hypochondrium, nor join'd with a jaundice. For which reason I should more readily suppose, with the observer of this instance, that the calculus, although furnish'd with concentric shells, as the figure shows, and internally, and externally, yellow, had been generated in some intestine, pretty near to the entrance of the bile.

So in the third example (k), I agree with the celebrated Albrechtus, who supposes the calculi to have been form'd in the intestine colon ; which calculi he, nevertheless, describes, of a triangular figure, swimming in water, and inflammable : I agree, I say, not so much because they contain'd, under an obscure external yellowness, a very white matter which was, however, solid, "like pretty hard soap," as because a violent pain was not wanting in the right hypochondrium. But, to take no notice of "the odour of impure lard," which proceeded from them in burning, and other circumstances, I do not see that any thing is any where observ'd in relation to the jaundice.

Finally, out of the four examples which I, at present, chuse to add, if the calculus which is so slightly mention'd by the celebrated God. Guil. Muller (l), as to call it "bilious," and to represent it as being form'd of strata, which inclos'd each other, could have been describ'd more fully, and we could have known with what previous, or concomitant, symptoms it had been discharg'd, perhaps I should admit it without any doubt : as I do certainly admit those, that the celebrated Jo. Phil. Burggrave (m) describes, as being discharg'd after violent, and those returning, pains of the right hypochondrium, not without an icteric colour, both in the face and in the urine. And some that were seen by the celebrated Brunnerus (n), although they were without a jaundice, we must, of course, admit for this reason, because by dissection, he found them already begun in the liver.

That is to say, a man having been troubled, almost ten years, with a con-

(e) *Commerc. litter. a.* 1740. hebd. 19. n. 2.

(f) *Eph. n. c. dec.* 3. a. 3. obf. 21.

(g) *Act. n. c. tom.* 7. obf. 100.

(b) *Eorund. t.* 3. obf. 82.

(i) *Eorund. t.* 8. obf. 121.

(k) *Eorund. t.* 3. obf. 57.

(l) *Eorund. t.* 6. obf. 69. circa medium.

(m) *Eorund. t.* 5. obf. 78.

(n) *Commerc. litter. a.* 1738. hebd. 18. n. 1.

stant pain of the belly, and particularly of the right hypochondrium, which at first was heavy, and obtuse, though attended with tension, but afterwards, at times, became acute, and, at length, very severe, nor chang'd its situation from the right hypochondrium, so as to be at last intolerable, discharg'd light, and yellow calculi, which were of a lamellated structure, and angular in their figure. This man dying after three days, had in his gall-bladder, which was enlarg'd, a mass of a dark red colour, inclining to blue, and green, and soft in its consistence; and in the middle of the cystic duct, and in the common duct, where it opens obliquely into the intestinum duodenum, a matter adher'd, which was somewhat less soft indeed, but, nevertheless, form'd by those ducts, into two "oblong and rounded" globules: finally, in the colon were found fifteen calculi compacted into one globe, but easily separable, and not yet so hard as those which had been discharg'd by stool.

It could not, therefore, be denied that these had been begun in the biliary ducts; and that having become, by degrees, less soft, they were, at length, harden'd by their abode in the intestines. And if "through the whole of" the disease, no sign of a jaundice manifested itself," either suppose that the matter was certainly more soft in the living body, than on the third day after death, when it was found in the ducts; and that therefore it not altogether obstructed the discharge of the bile, and had, perhaps, created pains by its acrimony, more than by its obstruction: or call to mind those things which I have hinted above (*o*), in a singular case of this kind, in order to conceive, that even when the common duct is obstructed, a jaundice may sometimes be absent. And in consideration of this it was, I just now said that the absence of the jaundice, but still more the absence of both jaundice, and pain, on the right side, ought to render the physician cautious, and make him attend to all the other symptoms, united, before he pronounces any thing.

Wherefore, to subjoin the fourth example, I shall not very readily exclude from the number of hepatic calculi, those which Fr. Slare (*p*) saw, and which were discharg'd by a noble woman, "who had been very much excruciated with "hepatic pains," at two different times, and in a few hours after the pain: for although in writing the case with brevity, as frequently happens, he has, perhaps, omitted what related to the jaundice, yet he has not omitted the odour of the calculi (that is when burnt) their colour, their taste, agreeing with that of bile, and besides these their lightness in water, and their inflammability. And I could wish that these two last-mention'd marks were either never at all observ'd in intestinal calculi, or at least always in hepatic; it would certainly be much more easy for physicians to take care, lest the one, as Matthiolus formerly fear'd (*q*), should be taken for the other.¹

But it has been shown, that those two signs, which most physicians made use of, with Reverhorst (*r*), are frequently fallacious. And if Vallisneri admonish'd us to beware (*s*), lest any calculi should be hastily thrown out from the number of hepatic calculi, for this reason, because they neither

(*o*) N. 34.

(*p*) Vid. commerc. litt. 2. 1735. hebdom. 5. in
2dnot. ad n. 2.

(*q*) L. 5. epist. med. 3.

(*r*) Vid. supra n. 25. 26.

(*s*) Adnot. 1. cit. supra ad n. 44.

swam in water, nor were inflammable; and this at a time when we had begun to weaken the credit of these signs, by a very few experiments only; how much more does it behove us to beware at present, when the experiments have multiplied upon us, to such a degree, that it does not seem possible to reduce the exceptions to any certain heads (*t*).

And how much cystic calculi may vary, not only in colour, and form, but even in the very external, and internal structure, and in the mode of their substance likewise, so as to be even sometimes pellucid, has been accurately remark'd above (*u*); left if any should, at times, occur, which differ in some respects, or even considerably, from the common appearance of biliary calculi, you immediately pronounce that they are not hepatic; and that you may previously, and particularly, consider the other properties, and well weigh all the symptoms, which have preceded, accompanied, or been the consequences of their excretion.

46. Nor indeed need the magnitude itself, to say nothing of the immense number, always deter you from supposing them to be hepatic. That the calculus was, without doubt, "of a surprizing magnitude," which a certain woman had discharg'd by stool, Vaterus (*x*) testifies: and yet the woman dying a little after its discharge, five others, of a lesser size, were found in her gall-bladder, being "of such a figure that it might be seen how they had " adher'd to that larger one," which resembled a little heart. You see, therefore, that this had all been in the cyst with them; and that its magnitude was no hindrance to its being discharg'd from thence, and coming down into the cavity of the intestines.

That also was large, inasmuch as it "equall'd the joint of a man's thumb," which the mother-in-law of the celebrated Van Swieten (*y*), who was liable to periodical paroxysms of the jaundice, discharg'd from the intestines, at the end of two days, after very severe, and excruciating, pains in the seat of the duodenum itself; and which was hollow'd out into two cavities on its surface, that shew'd two calculi still to remain, which were, themselves, also discharg'd afterwards, being not much less in size than the former. And yet the great bulk of this calculus had not prevented it from struggling through the narrow passages of the ducts.

Nor is it to be wonder'd at: for although the ductus choledocus is narrow, although the cystic is still more narrow, and the passage of it impeded by valves, they are nevertheless membranous, and, for that reason, can bear almost incredible dilatation. And from this cause it was that Bezoldus (*z*), found the cystic duct "eight times larger than it generally is, so as to equal " the thickness of a man's thumb; and in the middle of its length, a calculus of a remarkable size." And I myself, as is said elsewhere (*a*), have seen, "the common and cystic ducts, and the hepatic quite within the liver, " so dilated as to have a circumference equal to two inches," in an old man, in whose cyst, but particularly in the branches of the hepatic duct, I found calculi.

(*t*) N. 25. 26.

(*u*) N. 16. & seq.

(*x*) Diff. supra ad n. 16. cit. thes. 3.

(*y*) Comment. supra ad n. 15. cit. §. 950.

(*z*) Diff. de cholelitho cas. 1. n. 5.

(*a*) Epist. anat. 1. n. 43.

But in a woman whose gall-bladder contain'd a large calculus, although not yet quite indurated, the orifice of the common canal, where it opens into the duodenum, which is, at other times, very narrow, was seen, by Heister (*b*), to be so dilated, "that it could with ease admit the little finger of a man." And Hen. Albertus Nicolai (*c*), having found the same canal expanded quite to the gall-bladder, "in a very extraordinary manner," found the orifice no less open than it was found by Heister. But the younger du Verney (*d*) had even seen it larger. And Trew (*e*) had seen it very lax in a body, wherein the biliary ducts were equally dilated: the diameter of which, was found to be three times larger than it naturally is, by Kniphofius (*f*).

Other observations of this kind, which were at hand, I omit to mention; for these that I have mention'd, are not only sufficient, but I shall produce some presently (*g*), among which there will be one instance of a much greater dilatation. Since, therefore, these canals may be so dilated, and are found to be so dilated, there is no reason why we should doubt that gall-stones, even when they are of a considerable size, may pass through them; except when those pains in the right hypochondrium, which are the natural effects of such a dilatation, have not preceded. Wherefore as I commend Hoffmann, when speaking of those twenty stones of a remarkable size (*b*), for not supposing it altogether incredible, that in the ducts whereof I speak, "very small bilious calculi might first adhere, and, by degrees, get an increase from the bile which flow'd by them, and a great dilatation of these ducts being successively made, be obstructed there, for a long time;" so again I commend the same author, even still more, because he has shown himself to be doubtful, and even more inclin'd to the contrary opinion, for this reason, because these stones had been discharg'd, "without any violent pains of the right side having preceded."

I also set down as commendable in Bezoldus (*i*), that though pains of the right hypochondrium had, for the space of six years and more, preceded the discharge of a gall-stone; and although he, himself, and not without reason, judg'd it to have proceeded from the biliary ducts; yet he profess'd that he would "not obstinately adhere to the opinion," I suppose because there had not been an unusual severity of pain in that part, and greater than at any other time, when the stone, having, at length, overcome the narrow passes of the orifice of the ductus communis, suddenly burst forth into the intestine; or, at least, because there had been no exacerbation of pain, in proportion to the great bulk of the stone: and if it had been confin'd in these ducts so long a time, it certainly could not but have brought on a jaundice, unless some extraordinary disposition of the ducts be suppos'd; yet there is not a word said of either of these appearances.

I wish I could speak equally in commendation of Abraham Vater (*k*), in other respects a learned, and sagacious physician, who does not doubt but two calculi "of a considerable magnitude," that were discharg'd by stool,

(*b*) Aët. n. c. tom. 1. obs. 181.

(*c*) Commenc. litt. a. 1732. hebdom. 33. n. 11.

sub. 4.

(*d*) Loco indicat. supra ad n. 13.

(*e*) Aët. n. c. tom. 4. obs. 140.

(*f*) Eorund. t. 8. obs. 30.

(*g*) N. 47.

(*h*) Obs. supra ad n. 46. cit.

(*i*) Diff. modo cit. cas. 2 & §. 7.

(*k*) Obs. 3. supra ad n. 42. cit. §. 2. & seq.

“came quite from the gall-bladder, although “neither pain, nor any other “troublesome symptom, had been previously perceiv’d from them,” and though, even at the time, the excruciating pains of the belly were not seated in the right hypochondrium, but “had first occupied the umbilical region, “and, at length, fallen upon the region of the loins.” Yet he is not without his weight of reasons. But while among these, he produces examples of the very great dilatation of the very narrow osculum uteri in child-birth, and of the great distention of the slender ureters in calculous patients, it is surprising, it never occur’d to him, that neither the one, nor the other, is ever dilated, without severe pains.

47. However, let us see what may be said for Vaterus. An observation of Traffelmann is extant in Schenck (*l*), in which he describes “the meatus of the bile, where it is inserted into the duodenum,” as he himself had found it, “wide, inflated like a stomach, and fill’d on every side with “calculi,” some larger, and some smaller. If you ask what was the proximate cause of the patient’s death (who was a man of princely rank); it was a coma vigil, degenerating into an apoplexy. If with what symptoms he was previously troubled, you will find nothing at all, beside an incredible thirst, wherewith he had been tortur’d all his life-time. And can you suppose, that the physician who made this observation, and who appears to have been a diligent man, would, if a jaundice, or any pain in the right hypochondrium, or if any other symptom, which related to the meatus of the bile being so distended with calculi, had afflicted his own prince, either have been ignorant of it, or have pass’d it over, in an observation which was not very short? But if you do not believe this, you must of course acknowledge, that besides another duct by which bile might be carried to the intestines, and a jaundice prevented, it is possible that the meatus choledocus may, by means of calculi, which were before very few, being gradually increas’d therein, both in number, and magnitude, be immoderately distended indeed, but so slowly, and gently, that the patient may not at all complain of it.

Yet whatever you may think of this case, you will always be of opinion with me, that these things are very rare, and will, at the same time, observe, that quite a different judgment is to be form’d of quiescent calculi, and of those which have pass’d through the streights of the whole cystic, and common duct, even to its termination, by force. I do not, however, require, that as in the observation of Tinctorius (*m*), after a pain of the right side, which was extended to the intestines, there be discharg’d, together with the calculi, “a bloody and purulent matter;” it is sufficient for me, as it was for Bartholin (*n*), “that the ductus choledocus alone was dilated,” which was seen by him, on a similar occasion; and as, sometimes, during this dilatation, when the calculi are confin’d in the narrow parts of the ducts, and begin to be mov’d from thence, the ducts are hurt by the angles of the calculi, and the discharge, at length, happens not without the rupture of an abscess, which was thus brought on, and an excretion of blood and pus by stool, so, for the

(*l*) Obs. med. l. 3. ubi de cholidochæ meatu
obs. 3.

(*m*) Vid. supra n. 42.

(*n*) In ead. obs.

most part, this dilatation happens with much less violence, but scarcely ever without pain.

I have already describ'd in a former work (*o*), and taken notice of, even in the preceding letter (*p*), an observation of Valsalva, in which the upper part of the ductus choledocus communicated with the large cavity of an hepatic abscess, and the other part of it was enlarg'd so as to admit the finger, and, by this means, shew how in a living body, it could transmit more than two hundred vesicles, with which even then that abscess abounded, to the intestine. Of the many which had formerly been discharg'd by that meatus, it is probable that some had been obstructed in the narrow part of the duct, by coagula of blood, and that the bile, the passage of which was restrain'd, had by forcing from above downwards, together with the blood, dilated the canal.

This, however, is certain, that the morbus regius, vomitings, and pains, in particular, had preceded, which pains were so violent in the right hypochondrium, as frequently to excite the most severe distentions of the nerves. Which symptoms, and others there advanc'd, though you may in great measure refer to so very considerable a disease of the liver, yet if any one should choose to refer some part of them to the dilatation of the meatus choledocus, you certainly cannot deny the plausibility of his opinion. And if you do not deny that this may happen without pain, in a duct which is not irritated by angular, rough, and large stones, but even relax'd by blood, and ichorous matter, often flowing through it, consider whether you can possibly suppose, that the same can happen without pains when the lower streights of this duct have not been previously relax'd, but even contracted, from the irritations of the calculi?

48. Do not expect that I should make this letter, which is already too long, still longer, by adding many things in regard to the cure of this disease. Of which it will be sufficient to hint a few things. I have already said (*q*) that this disorder often recurs, nor is certainly known, unless when some calculus has been discharg'd, which previous pains about the region of the liver, had prov'd to have proceeded from thence. Therefore, one part of the cure will be to endeavour, when very sharp pains of this kind shall return, that the calculus may be dislodg'd from these streights. A second part, that if any other calculus remains, after this has been dislodg'd, it may, if possible, be dissolv'd. A third, to prevent the generation of new calculi. And each of these parts of the cure are to be attended to separately, and distinguish'd according to our position, nor ought the times, which belong to every one of them, be rashly confounded, as some seem to do, who heap up remedies promiscuously upon their patients; but the nature of the case, and the analogous cure of the urinary calculus, which is distinct in like manner, ought to be set before our eyes.

49. When the patient, then, is attack'd with these violent pains, we must do all in our power to appease them, not only to prevent his being rack'd, and falling into danger of inflammation, or distention of the nerves, but also

(*o*) Epist. 3. anat. n. 10.

(*p*) N. 10.

(*q*) N. 42 & 44.

that the calculus may get through the narrow passages. For the more this concretion, like a heterogenous body, irritates the ducts, the more the ducts are contracted upon the calculus, for which reason they both increase their own tortures, and prevent the passage of the stone. For this reason it is necessary to relax again and again: and to those things which are, of themselves, relaxing, and emollient, must be added, for the same end, diluters, demulcents, anodynes, and the most temperate antispasmodics, and, if intolerable pain compels you, even opiates.

Nor is it necessary to relax, only by internal remedies, but also by remedies externally applied, as far as it is in our power; I mean by the use of clysters, unctions, fomentations, and baths. To all which, where there is a fulness of blood, I do not see why venæsection should not be premis'd, not only to prevent the chance of an inflammation being brought on, but also to prevent the passages from being streighten'd, by the turgescency of the small vessels. Moreover, as I recommend every thing that may relax, so I violently suspect every thing that can irritate. For the detriment which they bring, by forcing the ducts to contract themselves, and become still narrower, is certain; and the advantage which many expect from the impulsion, and extrusion, of the calculus, uncertain.

Yet there are, you will say, instances of calculi reported, which powerful impellents, or strong emetics, and purgatives, have dislodg'd. I grant it. But who dares, purposely, to imitate the happy rashness of a case, without knowing (and who can for certain know?) that the passages are, already, sufficiently relax'd, so that nothing but the last impulsion, and agitation, is wanting; and that the case, at present, is not quite the reverse, so that by this rash and hasty method, the calculus must be thrown into streights, from whence nothing can dislodge it; by which, not only the pains become more excruciating, but the danger is greatly increas'd.

And indeed I see Hoffmann asserting (*r*), that emetics "are often found to be highly pernicious, if a calculus, inherent in the ductus cysticus, produces very grievous anxieties about the præcordia;" and Reverhorst (*s*), "readily confessing," that emetics "are a doubtful kind of remedy," whatever duct is obstructed by the calculus; and, finally, Scheffelius (*t*), purposely to omit others, for the sake of brevity, expressly says, in regard to purging medicines: "this I certainly would not imitate, as I should fear lest the calculi were so situated, at the same time, that they could not be expell'd, but might be disturb'd in their situation, and the pains from thence, exasperated," which even anger alone, as he immediately shows, and not only the stimulus of purging medicines, easily excites.

50. You perceive that he speaks of purging medicines, at the time, also, when the pains have ceas'd, by reason of the calculus being discharg'd: which is the second part of the cure. And I would, even then, abstain from purgatives, for the reasons just now mention'd, and would rather cleanse the intestines, by more mild remedies, lest the calculus that has been thrown into their canal, should happen to be obstructed there, and get such an in-

(*r*) C. 12. supra ad n. 44. cit. in cautel. §. 1. (*t*) Diff. supra ad n. 13. cit. §. 30.

(*s*) Differt. supra ad n. 16. cit. §. 66.

crease of bulk, as would make it, some time or other, hurtful to the patient. And I would have you beware of calling me a too timid practitioner, for this reason, or if you choose it, even call me so; for I am less afraid of this, than of being call'd a very bold one, or, at least, in this species of disorder, in particular, wherein, as is demonstrated above (*u*), frequently no kind of inconvenience is perceiv'd, when the calculi are in a state of rest. For which reason I would have you cease to wonder, that in this second part of the cure, I have omitted the consideration of impellents, and have only propos'd this one thing to be done, I mean that if any calculus should happen to remain, it may be dissolv'd, provided it be possible to dissolve it.

It does not, however, escape me, how little the remedies, recommended for this purpose, generally answer the expectations of the patient, or the promises of the practitioner, whether they are of a mild kind, which I would willingly admit,¹ or of a very acrid nature, or in any measure irritating, which I would shun. Nor is it to be wonder'd at; since even out of the body, the calculi which are long preserv'd in those fluids, by which, within the body, they are suppos'd to be dissolv'd, are by no means dissolv'd, unless they happen to be of the softer kind, such as Borrichius (*x*) saw "almost wholly dissolv'd in warm water," and after him Hoffmann (*y*); and I, even in water which was not warm, have seen them contract fissures, and burst into fragments, as I have written to Schroeckius (*z*). And they even sometimes, of themselves, break asunder into small pieces, as I have observ'd in some black ones; or even melt into a moisture, as that which Lanzonus (*a*) observ'd "to be spontaneously dissolv'd, into a green liquor."

For although, in order to describe this calculus, he says that "he had found the whole of the bilious juice to be stony," he has either abus'd the word "stony," in order to say that the bile was converted into a calculus, or the crust seem'd in great part to be stony, whereas the internal substance was very soft. On the contrary, the juncture may be very soft, and the substance, nevertheless, extremely compact. Thus Platner (*b*) saw that the fragments of a calculus, which, not being very close, "had soon fallen into pieces, could neither be dissolv'd by warm water, nor by spirit of wine, although they were steep'd in these liquors, for several days together, in a warm place." So also Bezoldus (*c*), having left little pieces of calculi, both in warm water, and spirit of wine, even rectified for some time, did not see that they were "entirely dissolv'd." Nor did Hoffmann (*d*) see "that gall-stones, which were of a more solid texture, and saturated colour," were dissolv'd in this manner.

Vallisneri (*e*), on the other hand, has experienc'd that they are dissolv'd by no liquor more easily, than by rectified spirits of wine made hot, and the spirit of turpentine. And in regard to the spirit of wine, he has the author of whom Haller (*f*) speaks agreeing with him; but some dissent from him in regard to the other spirit, and amongst these Tacconus (*g*), who entirely

(*u*) N. 37. 38.

(*x*) Apud Bartholin. cent. 3. epist. med. 85.

(*y*) Cap. 3. supra ad n. 44. cit. §. 6.

(*z*) Obf. supra indic. ad n. 20.

(*a*) Eph. n. c. cent. 3. obs. 62.

(*b*) Progr. supra ad n. 17. cit.

(*c*) Diff. de cholelitho §. 5.

(*d*) §. 6. paulo ante cit.

(*e*) Epist. supra ad n. 13. cit.

(*f*) Nota "i" supra ad n. 25. cit.

(*g*) Supra ad n. 16. cit.

differs in respect to them both. The same author; not to be too prolix, since you may, of yourself, see in the authors, whose names I have mention'd, and in others also, such experiments made with these and other liquors; the same author, I say, although he had seen one of those calculi, of which he has first spoken, that he had thrown into spirit of nitre, "become very tender," nevertheless affirms of those which he speaks of last, that they "were not at all chang'd" by that spirit, which both Vallisneri (*b*), and Bezoldus (*i*), had, in like manner, observ'd.

From these varieties you will, moreover, learn this circumstance, that we should not know what lithontriptic we ought to use, in this, or in that particular case, if it were certain, that these calculi, as they are, for the most part, less hard, and more friable, than the urinary calculi, so they are more easily dissolv'd by their peculiar lithontriptics: although in comparing both together, not only the substance, and the adhesion, or joining, of the parts are to be consider'd, but also how much sooner the dissolvent liquor, and how much greater a quantity of it, is carried to the urinary passages than to the biliary.

And on account of this animadversion it was, that, although in the first part of this cure, very large draughts of warm water are propos'd by many, I said nothing thereof, which is a subject I should not have been silent upon, if the same were propos'd, when a calculus was confin'd in the kidneys, or ureters. Yet if you ask which I would select in particular, out of such a number of different remedies, that are promiscuously recommended by many, in this second part of the cure; no others more readily, I shall answer, than those which are the most incapable of doing harm; as, for instance, the juice of taraxacum, since with this Boerhaave is said, by his disciple Scheffelius (*k*), "to have often cur'd the calculus of the liver successfully," or of fresh grass, which has been celebrated by every body, since Glisson (*l*), and Sylvius (*m*), for this purpose. And certainly the illustrious Van Swieten (*n*), has shown what may be done in such a case, by this one herb alone, from the example of a certain pauper.

This author, also, having overcome this disorder in others, likewise, by decoctions of grass, and taraxacum, and by other things taken constantly, for a long time together, says, "that he had then always found calculi, or, at least, calculous coagula, in a very considerable quantity, in the stools." And although he confesses, that he was not, for this reason, certain that these were "the parts of comminuted calculi," rather than the small beginnings of new calculi, such as I have more than once demonstrated, above (*o*), to be found in the cyst; yet the observations of Glisson, which he himself also allows of, sufficiently show that those calculous tubuli (*p*) which are form'd in the biliary passages, of oxen, in the winter, are dissolv'd by feeding on fresh grass; for otherwise, he would not have found these tubuli frequently "about the time of Lent, or Easter only, or before," but afterwards equally.

(*b*) Epist. cit.

(*i*) Diff. cit. §. 6.

(*k*) Dissert. supra ad n. 13. cit. §. 31.

(*l*) Anat. hepat. c. 7.

(*m*) Prax. med. l. 1. c. 45. n. 13.

(*n*) §. cit. supra ad n. 46.

(*o*) N. 19.

(*p*) Vid. supra, n. 12.

51. Finally, the third part of the cure will prevent new calculi being generated, in the first place, if it shall be able to amend whatever disorders there may be in the liver, and, in like manner, in the blood, upon which the production of calculi depends: in the second place, if it remove those things by which these disorders are us'd to be brought on. These disorders in the liver, are a weakness, laxity, obstruction, and other things of the like kind; and in the blood a quantity of viscid and earthy particles, and a slow propulsion thereof, especially through the liver. Moreover, these disorders are brought on by the too frequent use of unwholesome meats, and drinks; by the bad digestion of the same; by the quantity of diluting liquors not answering to the quantity of food taken in; by too much sleep; by a sedentary life; especially by bending the body too much forwards; by violent passions of the mind, and any other causes which you see plainly, of yourself, ought to be remov'd by the physician.

But, without doubt, this part of the cure is sufficiently treated of by many. Yet as it very often happens, either by the conformity of the patient not being sufficiently continu'd, or by the difficulty of bringing back the liver to its perfect sound state, just as we see in the case of urinary calculi, that new ones are generated; nevertheless, it will, at least, be worth while to endeavour, that, as far as is possible, the canals of the bile may be preserved soft, and lax, that they may not give great resistance to the new calculi which are to pass through them, but may easily yield; and this will be brought about, by means of a continual, but moderate, use of diluters.

52. As to the lithotomy which has also lately been thought of, in the gall-bladder, do not be surpris'd that I made no mention of it above. For, in the first place, the pains which are excited by gall-stones, that are endeavouring to discharge themselves, are not only brought on by those which come from the cyst, but also by those that come from the hepatic duct. In the second place, those cystic stones which are the largest, and on account of which this lithotomy seems, to some persons, to be chiefly desirable, neither endeavour to disengage themselves, nor create any great uneasiness; or, at least, for the most part. And to these we may add, that unless some accident has united the gall-bladder with the peritonæum, the cutting of it is destructive; and although this connexion has taken place, in some bodies, from the effect of disease, in which chance gave occasion to suggest this new species of lithotomy, as it often has suggested other things, yet how seldom such a connexion is met with, even in a morbid state of these parts, is well known to anatomists: and surgeons know very well, how difficult it is to be certain when it does really exist.

Last of all, although there were no danger in cutting, can you suppose there would be no great difficulty in healing the wound? We have, before our eyes, examples of three women, one of Bologna (*q*), of Francfort (*r*), and of Gottingen (*s*), in whom a tumour, having arisen in the epigastrium, and being open'd, either by art, or spontaneously, discharg'd cystic calculi at its aperture. I read that the first was cur'd: that the second had a fistula left, by which a thin and chylous kind of liquor, but of a yellow colour, distill'd:

(*q*) Vid. Taccon. supra ad n. 16. cit.

(*r*) Act. n. c. tom. 6. obs. 69.

and the third had an ulcer remain, which, with its sanies, discharg'd "bilious calculi at times." And this last history may, perhaps, lead the surgeons into hesitation, whether the wound should be shut up afterwards, or kept open, in some measure, for fear of new calculi.

It does not escape me, however, that before the swelling occupies all the muscles which lie before the cyst, causes a considerable suppuration on all sides, and the pus forms winding sinusses for itself, which require so much diligence, and application, in the cure, as in the Franckfort woman; it does not, I say, escape me, that the case must, of course, turn out more successfully, with those who open, by incision, the cyst which has now closely coalesc'd with the peritonæum: and that the signs of such a coalition have been pointed out by a skilful surgeon. Nevertheless, as it is a thing that is entirely new, notwithstanding it may sometimes have great utility, I thought it rather became me to wait till time shall confirm its advantage, and remove all doubts, dangers, and difficulties, by many repeated experiments, than to be in haste to propose the operation, just as if it were altogether perfect.

53. Thus you have a treatise on biliary calculi; not that, indeed, which Vallisneri wish'd for (*t*); but as much as it was in my power cursorily to add to these things of which I had written, less at large, before, once, twice, and even three times. And if Sossigenes, as you have it in Pliny (*u*), "in his three meditations, although he was more accurate than others, did not cease to have doubts, and frequently to correct himself;" do not wonder that I, though not a negligent man indeed, but yet by no means to be compar'd with those who have hitherto written of these calculi, should have added this fourth meditation to the three former. Farewell.

(*t*) Haller opusc. pathol. obs. 33. hist. 8.

(*u*) Nat. hist. l. 18. c. 25.

(*t*) Epist. supra ad n. 13. cit. adnot. 2.

LETTER the THIRTY-EIGHTH

Treats of the Hydrops Ascites, Tympanites, of the Dropsy of the Peritonæum, and of others that are call'd encysted Dropsies.

I Am afraid that the very long letter which was lately sent you from me, will be succeeded by one still longer, as I see that the twenty-first section in the Sepulchretum, the argument of which I must now pursue, that is *de Ventris Tumore Hydrope*, is so prolix. For in regard to the nineteenth section, which is entitled *de Scorbuto*, or the twentieth, entitled *de Cachexia Anasarca, Leucophlegmatia*, I have no reason to dwell upon either, since in those cities, wherein I have spent my life, it happens very rarely, if ever, that any one is carried off by the scurvy; and you will find dissections of those who have died of this disease, up and down among other authors, and some particular dissections in the writings of Poupart (*a*) and Mead (*b*); and the three other disorders, cachexy, anasarca, and leucophlegmatia, are of such a kind, that they may, with much more propriety, or at least with much more convenience, be refer'd to other heads.

Wherefore, the section that is dedicated to them; when you take away the Scholia, and the observations, which, as we are expressly admonish'd, relate to fevers, phthisis, pains, or tumours, of the belly, melancholy, paralysis, dyspnœa, syncopé, or other disorders, and one of which is, in the mean time, repeated (*c*); is reduc'd to but a small number: and many of these relate equally to other subjects, and particularly to dropsies of the abdomen. And if the ascites and tympanites, of which I am to treat, were the only subject-matter of the twenty-first section, perhaps this letter would not be longer than the former. But, as besides those, the greater of the other tumours, with which the belly is subject to be affected, are spoken of in that section, I have resolv'd to defer the consideration of these to the next letter, and not to treat of any other disorders here besides both the dropsies of this cavity, and of the peritonæum, and of those that are call'd encysted.

Yet you will not expect to have over again, in this place, those observations which I have given in other places, and particularly, when writing of the dropsy of the thorax; for I shall only give you such as have not been yet

(*a*) Mem. de l'acad. r. des sc. a. 1699.

(*b*) Monit. med. c. 16.

(*c*) Vid. obs. II. §. 6 & 9.

related, either from Valsalva's papers, or my own. And these are Valsalva's which immediately follow.

2. A man of sixty years of age, and troubled with a hernia, was seiz'd with a difficulty of breathing, and thirst. His belly and feet became tumid. At length, his thirst remitting, he died. The adipose membrane of the abdomen, and the muscles when cut into, were found to contain a serous matter in their interstices: a fluid of which kind was also found in the cavity of the belly. With the lower part of this cavity, on the left side, a sacculus made out of the peritonæum, and containing a portion of the intestines, communicated. In the thorax, the pericardium abounded with serum. The blood in the ventricles of the heart was fluid.

3. Whatever was the cause of the dropsy, in this man; for although it cannot be denied, that when the intestines fall down, and form a hernia, a lymphæduct may sometimes be burst in the mesentery, which is drag'd down with violence, yet that this happens very seldom, and when it does happen, that the chyle flows out together with the lymph, we are not ignorant; whatever then was the cause, you see that to the ascites, two other dropsies, that is the anasarca, and the hydrops pericardii, were added. For it rarely happens, that this disease is simple: which almost all the following histories will join to confirm.

4. Julia Bonetti, a woman of fifty-five years of age, slender, and, on both sides, gibbous, having begun, a few months before, to complain of her respiration being somewhat difficult, was, at length, brought, on the twenty-ninth of November, in the year 1688, into the hospital of St. Mary de Morte at Bologna, as a patient of the house. She breath'd laboriously, and that more when she lay on her left side than on her right. But if she sat up in bed, then the difficulty of breathing was so much increas'd, that she was almost suffocated thereby. All remedies being of no effect, and the difficulty of breathing increasing daily, her pulse became weak, and languid: she was attack'd with frequent swoonings; her face was tumid, and, in some measure, inclin'd to a livid colour; and thus she died in the beginning of December. The cavity of the belly was fill'd with a limpid water. The omentum, being without fat, was fill'd with certain vesicles. The cavity of the thorax, on the right side, contain'd about four ounces of water, and the left as much as it could possibly hold, so that it flow'd out as the sternum was cut away. In this cavity the lungs were somewhat tumified, and of a purple colour, as if they had been seiz'd with inflammation; but in the other, they differ'd little from their natural state. The right ventricle of the heart, together with a great quantity of concreted blood, had, also, a polypous concretion, of the thickness of a finger, which was produc'd both into the vena cava, and the pulmonary artery. In the left, only the beginning of a concretion of this kind appear'd.

5. Which of the dropsies preceded the other, whether that of the thorax, or belly, is not easy to pronounce, in histories of this kind. However, if on account of the deprav'd structure of the thorax, you would, also, have it that this cavity must first have collected the water, I shall not contest the opinion. Be this as it will, I should suppose that on account of the same structure, those circumstances had happen'd, which are taken notice of in this

woman's history, and which are so contrary to what generally happens; I mean, that she breath'd with more difficulty when lying on that side, in which the lungs were tumid, and there was a great quantity of water; and that when sitting up in bed she was almost suffocated.

6. An old woman began to have her whole body swell'd, in the autumn, to have her respiration become difficult, and her thirst troublesome. To these symptoms was added, (though indeed the thirst left her before the end of her life) a cough, attended with a spitting of catarrhus matter, and a difficulty of lying down on the left side, so that, for this reason, she almost always lay on her right side: and in this posture she died, when her pulse had become so contracted, that it could scarcely any longer be perceiv'd.

While the skin and muscles of the body were cut into, a great quantity of serum was discharg'd. The belly was also fill'd with serum, which had protuberated with a very large, but soft tumour. This serum, being receiv'd in a glass vessel, resembled the colour of urine, and after standing one or two days, shew'd a concretion swimming upon it, of so firm a nature, that it was not broken into pieces, even by the agitation of the vessel. The remaining fluid part, being put on the fire, became presently turbid, and grew pretty thick, and, soon after, began to show a slight concretion, on the sides of the vessel: but as the evaporation proceeded, it form'd a pellicle on its surface: and after having decreas'd, thus, to less than half its quantity, became perfectly similar to barley-cream. The liver was distinguish'd, here and there, with whitish spots, which were externally larger, and internally smaller, and was in general of a pale colour. The spleen was very hard. The lymphatic vessels occur'd, pretty evidently, of themselves, about the loins, and below, through the internal parts of the belly.

In the left cavity of the thorax, the lungs were on all sides free; but in the right, were tied to the pleura, in the whole circumference, by many membranous connexions, and those entangled with each other: and if you handled these membranes, a great quantity of serum, which had been shut up in their interstices, issued forth. In the sinusses of the heart, was contain'd a great quantity of blood, fluid in its consistence, and of a dilute red in its colour, as in all the vessels likewise: and the heart was surrounded with serum, wherewith the pericardium was not only fill'd, but had even been extremely dilated. This serum of the pericardium, although, in its colour, and the firm concretion that was spontaneously produc'd in it, very similar to that which had been contain'd in the belly, yet did not coagulate, when applied to the fire, but being perpetually fluid, and flying off by degrees, left only a slight crust in the bottom of the vessel. The saline particles, of both these kinds of serum, were examin'd, but were not found to be of any certain figure: yet the figures of the particles of the former kind of serum, differ'd something from the figures of the particles of the latter. The concretion, which swam in the serum of the pericardium, was nearly of a spherical form, and seem'd to be made up of small vesicles, as it were, collected together into one body.

7. It was a custom with Valsalva, when he had found water extravasated into the cavities of the body, not only to attend to the nature of it, but also to enquire thereinto, by experiments, of different kinds; often making use of

fire, and sometimes mixing ingredients with the serum. He was wont to examine the situations of the lymphæducts likewise, and to remark whether they were turgid, or did not at all discover themselves. Both these customs of his, you will remark in most of the observations of this kind, that he has left, but particularly in that which I have just describ'd. He meant to inquire, I suppose, by both these methods, from whence the water had proceeded, whether from the rupture of those vessels, or from any other cause, that he might, perhaps, after a long series of observations, attain so far, as, from a portion of water, taken from a dropscical person when living, to be able to distinguish that this had flow'd out of those vessels, and, consequently, to pronounce the disorder incurable.

For supposing this diagnosis, as, for instance, in an example I have already taken notice of to you (*d*), this prognosis follows, which was equally unknown to the ancients, as those vessels themselves: by the discovery of which, some, who have rebuk'd those that apply very diligently to anatomy, imprudently contended that the prognosis, in this disorder, was not at all chang'd; and this being thus chang'd, it is evident that the method of cure is also chang'd, which the same gentlemen denied; for why should the physician trouble, with very strong, and violent remedies, those in regard to whom he ought to think, only how to preserve their lives, as long as possible, instead of attempting to cure their disorder?

But I said that Valsalva had need of a long series of observations of that kind, for this reason, because the lymph itself is different, in different bodies, and at different times. And indeed Reverhorst (*e*), moreover, added the difference of the place from whence it proceeded, saying that the ascites, wherein a yellow, and bitter, water is drawn off, arises from the lymphatic vessels of the liver being injur'd. But as I do not think it necessary to depend upon his authority, so I do not think it sufficiently safe, to agree with those who assert with Bonetus (*f*), that the water of dropscical persons, which is "limpid, colourless, or but slightly ting'd," is from the lymphæducts, but that the water which is like "serum, sometimes pure, sometimes mix'd with "other humours, and resembling the colour of urine," proceeds from the veins. For although in the patient of whom he speaks, whose urine seem'd to be a lixivium of a quite black colour, rather than of a colour almost black, that limpid water, which he describes, could have flow'd from no other part, but from the lymphæducts, into the belly, yet in others, whose urine is of a different kind, it may have come from some other part.

8. And again, if the lymph, which was at first limpid, be chang'd by stagnation, and mix'd with the putrid eluvies of the viscera, which even itself does at length corrupt, must we, for that reason, suppose it not to have come from the lymphæducts? To this add the several fallacies, which, without a very close, and accurate attention, may often impose upon us, in the dissection of bodies. For the water, which first flows out, will be sometimes limpid, not that it was so in the patient when living, but because the grosser particles having subsided, in the dead body, the water, which lies uppermost,

(*d*) Epist. 16. n. 5.

(*e*) Diff. de mot. bilis §. 21.

(*f*) Sect. hac 21. schol. ad obs. 18.

becomes very pure. On the other hand, sometimes, when it was pure in the living body, it is made impure from the very dissection.

Thus I formerly observ'd, when I had begun to divide the ribs from the sternum, in a certain dropical woman, that the water burst forth in a state of perfect limpidness: but when I had divided all the ribs, and taken away the sternum, that the water appear'd to be redish: finally, when I had handled the viscera, and just begun to cut into them, that all the remaining water had contracted a red colour. And these circumstances ought to be the more attended to, in proportion as there is less water originally, or less remaining, so that a little blood being gradually, and almost clandestinely, mix'd with it, the whole may be ting'd. There are hydropic waters also, which have impurities mix'd with them, even before dissection, from a disease in some viscus or other, as I have already hinted, which is less likely to deceive us, where the disease of the viscus is considerable, and where there is a great quantity of water.

Thus in the dissertation of Schacherus (*g*), as to the ascites was join'd an increas'd and diseas'd state of the ovary, it was not surprizing, that the water, which was, in other respects, pretty limpid in appearance, should, by means of evaporation, "have soon coagulated into a fat substance, in such a manner, that one fourth part of it only, had consisted of water, which "was evaporated, and the other three were made up of the sebaceous portion, which remain'd behind." So I also remember to have heard Albertini say, that the waters of some hydropic persons, by being expos'd to evaporation, had flown off in a very small degree, but had in great measure, I suppose from some cause of this kind, coagulated; whereas the waters of others had, on the contrary, chiefly flown off, by applying the same degree of heat, and a very small part, only, concremented.

But we must be extremely cautious, when the disease of the viscus is so small, that it may easily escape the eyes of the dissector, lest if any part of the water coagulate, by the force of the fire, it should not be refer'd to its true origin. From these things, and others, which I purposely pass over, I would have you understand why I said it was necessary, that Valsalva should have made a great number of these observations, which I do not despise, but only require to be made with the most cautious, and exact diligence; so that those in which there might be any fallacy, being set aside, he might apply the others, compar'd with similar experiments on the lymph, and on the serum of the blood, to those purposes which he had propos'd to himself, whatever these might be, with advantage. To this kind of comparison we are exhorted by the celebrated Phil. Frid. Gmelinus (*b*), when he proposes his experiments upon the water of an ascites, taken from a certain woman. Others you will read upon the fluid, which the vesicles of an encysted dropsy contain'd, made by the celebrated Jo. Christop. Pohlus (*i*). And some more simple experiments, as evaporation was alone made use of, you will find in the writings of the illustrious Senac (*k*). You will find some peculiar ones, that is to say, some which relate to a milky dropsy, that arose, as it

(*g*) Diff. de virgine ascit.

(*b*) *Commerc. litt.* a. 1745. hebd. 52. n. 3.

(*i*) *Act. n. c.* tom. 8. obs. iii.

(*k*) *Traité du Coeur.* l. 4. ch. 3. n. 4. & ch.

9. n. 2.

seems, not only from chyle pour'd out of the chyliferous vessels when ruptur'd, as in the observation of Littre (*l*), but also from this fluid being mix'd with a great quantity of that water, which is common to patients troubled with an ascites; you will find them, I say, in the history of the Royal Academy of Sciences at Paris (*m*). But what kinds of water are, for the most part, drawn off from dropical patients, and how various these are, the younger du Verney has taught in another part of the memoirs of the same Academy (*n*); and that in a more simple way certainly, as, without making use of any external assistance, he depends upon his senses only; but in a much more commodious manner, and one that tends to be of more extensive use, in forming a prognosis.

9. But lest we should seem to be forgetful of the old woman, whose history I have given you (*o*), if you compare it with that which immediately precedes, of the gibbous woman (*p*), and with the first of the man (*q*), you will perceive that the old woman's lying-down was just such as the side of the thorax, that was most affected, required. And in regard to the thirst which remitted before death in the man, and was remov'd in the old woman, you may conceive of it in this manner; that either the power of feeling was grown very obtuse, near the time of death, or that when the belly was quite distended, the moisture, which remain'd in the blood, went in part to moisten the fauces, as the catarrhus matter, which the old woman spat up, demonstrated. For it is not necessary to suppose that the serum of the blood is unfit to remove thirst, in all dropical bodies, I mean that it is more like brine, as has been found by some who have tasted it, than water.

10. The belly of a man of fifty years of age, who had labour'd under an universal dropsy, notwithstanding there appear'd no tension externally, was full of water. The liver was of a black colour, the spleen was somewhat increas'd, the other viscera of the belly were sound. The lymphæducts were extremely turgid: and as there were many glands below the emulgent vessels, near to the vena cava, and round the great artery, those ducts were carried from the mesentery to these glands, and from thence into the thoracic duct.

In the thorax was a watry humour, and the lungs were variegated with black spots. The pericardium was so far expanded with its proper dropsy, that it resembled the urinary bladder of an ox, when distended with air. As all the vessels of this body were large in proportion, so the heart was also large; and the left auricle thereof so dilated, that it almost equal'd one half of the heart, when of its natural size. And the heart had these remarkable appearances, that the external membrane was eroded on the left side, and the vessels had varicous contorsions; but in the ventricles it contain'd a fluid blood, without any sign of concretion.

11. It is not easy to suppose that Valsalva; as he had found the pericardium to be so greatly distended with water, and the left auricle to be so en-

(*l*) Hist. de l'acad. r. des sc. a. 1710. obs. anat. 7.

(*m*) A. 1700.

(*n*) A. 1703.

(*o*) N. 6.

(*p*) N. 4.

(*q*) N. 2.

larg'd, that from hence, in all probability, as the motion of the blood must be on all sides retarded, so an universal dropsy was in great measure the consequence; it is not easy, I say, to suppose that he had not enquir'd, minutely, into all the symptoms with which the patient had been troubled, or that if he had heard of any thing peculiar, he would not have remark'd it. Yet in regard to the dropsy of the pericardium, as the old woman, also, of whom I spoke above (*r*), had her pericardium very much dilated with water, you might have seen among the symptoms related in that history, whether there was any thing peculiar to the dropsy of the pericardium, rather than the other preternatural appearances, which were found at the same time.

At least, it was not, in the beginning of the disease, very difficult for the patient to lie down, nor necessary in the latter part of it; nor is it said to have been with the head declin'd: which things you will compare with those that are made mention of by me, where I have examin'd, with a studious desire after truth (*s*), other symptoms of that dropsy which have been propos'd by other writers. But lest you should begin to suspect, from the next observation which I shall subjoin, that the peculiar symptom thereof, is a necessity of lying in a supine posture, you must attend to many other histories in which the disorder was without this symptom, but, in particular, to that which will immediately follow the next.

12. An old woman of seventy years of age breath'd with difficulty, was very thirsty, troubled with a dry cough, and could lie only in a supine posture. After these symptoms had lasted for a long time, and the feet began to be œdematous, she died.

The belly was full of water. The lymphæducts about the great artery, where it gives off the emulgents, were turgid; in the mesentery, and elsewhere, they scarcely appear'd. The kidneys were small, and without hydatids. In the thorax the lungs were found: and a small quantity of serum was contain'd there. But the pericardium was full of it: in which the heart, being twice as big as it naturally is, contain'd a flaccid polypous concretion: and the auricles contain'd blood, with which they were very turgid. However the blood, in this body, preserv'd its natural fluidity, and colour.

13. An old man of seventy was troubled with an œdematous swelling of the feet, and a great thirst, and was seiz'd with a cough that was, at times, so painful, and vehement, as to make him seem on the point of suffocation. He spat up a catarrhus matter: he breath'd with difficulty: he could lie down in a supine posture only: his pulse was low and weak. He died.

In the belly water was extravasated: and the lymphæducts, about the division of the emulent vessels, were so tumid, that three or four were, each of them, separately taken, equal in thickness to a goose quill. The spleen was very large, and show'd some small bodies on its external surface, like the grains of millet seed.

In the thorax, both lobes of the lungs adher'd to the back, the sides, and the sternum, leaving interstices betwixt themselves, and the pleura, which contain'd water. On the other hand, in the pericardium was no moisture: and this part, itself, began already to be connected to the heart, by many

(*r*) N. 6.

(*s*) Epist. 16. n. 45.

membraneous fibres. In the ventricles of the heart was a coagulated blood, and in the right auricle also, in which, at first sight, it resembled a portion of the uterine placenta. In the left ventricle was a polypous concretion, which was universally unconnected.

14. You see, therefore, by comparing both these observations together, that although a supine posture of lying down was, in both cases, necessary, the pericardium, nevertheless, was not in both cases full of serum, and even that in the old man, it contain'd no moisture at all. And if you compare the disorders of the viscera one with another, you will find, indeed, that they were considerable in both the histories, but not the same. Nor had both of them the same state of blood; but even, which you might also have observ'd in the hydropic persons spoken of above, that it was quite different in the two. For in the old woman it was fluid; in the old man coagulated: and what polypous concretion it had, was in her flaccid and lax, in him pretty compact, and, what was rarely observ'd by Valsalva, in the left ventricles, not in the right. The causes, therefore, of making use of one and the same posture, in lying down, are various, and are frequently difficult to be accounted for, as I have shewn already (1); and as will be shewn by comparing the two following observations with each other, and with the last foregoing.

15. A woman of a slender habit, and in the twenty-seventh year of her age, having, four months before, receiv'd a wound at the navel, breath'd with difficulty, was very thirsty, expectorated a little, and complain'd of a pain in the left part of her thorax, on which side, as well as her back, she could not lie down. All these symptoms growing very violent, she died.

In the belly, all the viscera were found; so that even in the intestines, where they corresponded to the navel, not the least mark of disease could be distinguish'd, besides a colour inclining to blackness. Yet the cavity of the belly contain'd three or four pints of yellowish water.

The cavity of the thorax, also, on the left side, was full of water, perfectly similar to that of the abdomen, this circumstance excepted, that certain concretions, like pellicles, swam therein. In this water was contain'd the lobe of the lungs, in a very sound state, and free from all adhesion: But the right lobe of the lungs exactly fill'd its cavity, inasmuch as it adher'd to the pleura, every where, so closely, that it could scarcely be separated: and it was a little indurated, so that it seem'd to have been, in some measure, attack'd with a phlegmon. Both ventricles of the heart contain'd a lax polypous concretion; yet the right a larger than the left. But in this body the lymphæducts were not at all turgid.

16. A young man, of about seventeen years of age, was seiz'd with a difficult respiration, with a dry cough, and a very great thirst. He discharg'd but a small quantity of urine. He had a little pain on his right side, and lay continually upon it. At length he died.

The belly was full of water: the intestines, and stomach, were whitish: the whole liver was hard: but the spleen, except that it was somewhat enlarg'd, was, in other respects, sound. The lymphæducts were not turgid, as is sometimes observ'd in dropical bodies, when the viscera are sound.

The cavity of the thorax, on the right side, overflow'd with water. There-

(1) Epist. 20. n. 25. & alibi.

in, alio, the lungs had grown hard : and on the whole of the surfaces, by which this lobe was turn'd to the diaphragm, and mediastinum, did it adhere to these parts. In the pericardium was little or no serum. In all the vessels, even in those of the viscera, the blood was fluid.

17. Why this patient should lie on his right side, you immediately perceive, as soon as you consider that the quantity of water, which was in the same side, must of course have oppress'd, and suffocated, the other lobe of the lungs that was found, had he chang'd his posture. But how did it happen that the woman (*u*), who had water in the left cavity of her thorax, could not lie down on her left side ? Without doubt it is necessary for you to consider the state of the lungs, the left lobe of which was found in the woman ; and the right in the young man, diseas'd. Yet how was it that the woman could not lie on her back ? For in this posture, neither side would have injur'd the other, either by its weight of water, or by the bulk of the lungs, which had been attack'd with the phlegmon. The old man (*x*), at least, though he had both lobes of the lungs so connected all round, and, at the same time, press'd upon in the whole of their circumference, by water collected in the surrounding interstices, not only was able to lie on his back, but was under a necessity of lying in that posture.

You see, then, why I said that these circumstances, of lying in different postures, are sometimes not easily to be accounted for. But it is better not to say any more of this subject, at present, and to subjoin the other observations of Valsalva, wherein he did not see the turgid state of the lymphæducts, join'd with the dropsy, which you might have, also, remark'd, in the two histories just now describ'd : although I suppose it did not appear very plain to you, or to me, why he said, in the last, that this turgescency is sometimes observ'd in hydropic bodies, when the viscera are found : which he certainly could not refer to the old woman (*y*), to the man (*z*), to the other old woman (*a*), or to the old man (*b*), in whose bodies, although there was this turgescency, yet the viscera were not found nevertheless.

He must, of course, then, have had an eye to other observations of his, as, for instance, that which I have already describ'd to you (*c*), in which, when all the abdominal viscera of an hydropic body were in a healthy condition, the lymphatic vessels were turgid at the same time : and perhaps he meant nothing else here, than that these vessels were, sometimes, found to be turgid, even in those dropical bodies, whose abdominal viscera are found.

18. A young man of about eight and twenty years of age, being much given to eating and drinking, and having labour'd, for some years, under a difficulty of respiration, fell, at length, into a universal dropsy. To this was added, about seven days before death, a very considerable difficulty of breathing, with a cough, spitting, and pain in the thorax.

In the carcase, the belly, and thorax, were found to be full of a brownish serum, and all the viscera, except the intestines and the stomach, ting'd of the same colour. This last mention'd viscus vastly exceeded the bounds of its

(*u*) N. 15.

(*x*) N. 13.

(*y*) N. 6.

(*z*) N. 10.

(*a*) N. 12.

(*b*) N. 13.

(*c*) Epist. 16. n. 4.

natural magnitude. The spleen also was enlarg'd, three times more than it ought to be. The bile was of a pale colour. None of the lymphæducts came into view.

The left lobe of the lungs was very much inflam'd; from whence death was justly suppos'd to have been accelerated; and was found to be connected to the pleura by membranes, in the interstices of which the serum, that I have describ'd, was confin'd.

19. That by the force of hypothesis, rather than by the authority of Hippocrates, or the dissection of dropfical bodies, most physicians were formerly induc'd to believe the liver first, and after that the spleen, to be the cause of dropfy, you will learn even from the Sepulchretum; either in the place where it is shown (*d*), that in the books of Hippocrates, not any one, or two, viscera are suppos'd to be in fault, but many, or where (*e*) many examinations of the viscera of dropfical bodies being produc'd, both of these viscera are, demonstratively, clear'd from the charge. And, certainly, whatever part, or whatever cause, can, for a considerable time, retard the motion of the blood, or lymph, or immoderately increase the secretion of the moisture, with which all the cavities of the body are furnish'd; or, in short, prevent, or diminish, by any means, its absorption, may give origin to this disorder.

But the belly, besides these viscera, has peculiar parts, from which a humour is sometimes pour'd out, into its cavity. There was, says Piccolhominus (*f*), a man who drinking a great quantity, and discharging no urine, even by the introduction of the catheter, had his belly swell'd to a surprizing degree, and having at length died, shew'd his kidneys to be entirely lacerated with calculi, so that it was manifest the urine had flow'd out of these viscera, into the belly, and had distended it.

In the Sepulchretum, where I have look'd for this observation of Piccolhominus to no purpose, you have others of Platerus (*g*), and Dodonæus (*h*), of an ascites, that did not owe its origin to the liver, or spleen, which were found, but to the urine having flow'd out of the kidney, or the bladder, which had been perforated by exulceration. And as to what is hinted, besides, by Dodonæus (*i*), it is by no means doubtful, but the same thing must happen, if the ureters should chance to be burst, or eroded; and it is even hinted by Galen (*k*), and confirm'd, among others, by Eustachius (*l*), that if these tubes are cut into, in a living beast, and the abdomen sew'd up again, the cavity of the belly would be found "entirely full of urine, as if the animal labour'd under a dropfy:" and that the same thing had happen'd in two men, from the rupture of these canals, the histories of Abraham Vater (*m*), and Winhart (*n*), teach us.

To this class of observations, that of the celebrated Bernerus (*o*) must be refer'd, which was made upon a boy of six years old, whose urine, not being able to get out from the kidneys, had so distended them, that having open'd

(*d*) Sect. hac 21. Schol. ad §. 4. obs. 7.

(*e*) Sect. ead. obs. 1. & seq.

(*f*) L. 2. anat. præl. 23.

(*g*) Sect. cit. obs. 8. §. 2.

(*h*) Ibid. obs. 25. §. 23.

(*i*) Ibid.

(*k*) De natural. facult. 1. 1. c. 13.

(*l*) Tract. de ren. c. ult.

(*m*) In progr. edito Witemberg. Januar. a. 1720.

(*n*) In append. tom. 2. act. n. c. sub. n. iii.

(*o*) Eorund. actor. t. 1. obs. 219.

a way for itself, through their surfaces, it distill'd into the cavity of the belly, and surrounded the intestines. And, indeed, to this class also, belong ulcers perforating the stomach, in such a part, that by affording an exit for liquids, rather than for solids, they may either generate or increase an ascites. Thus it happen'd in the observations of the learned men Samuel Gratius (*p*), Ad. Christ. Thebesius (*q*), Rud. Jac. Camerarius (*r*), and Jo. Georg. Hoyerus (*s*).

Moreover, to those examples which are pointed out from the Sepulchretum, of the liver, and spleen, being without disorder, in dropical bodies, new examples that might be added are not wanting. Turn, for instance, as you may to others, and among them, to that which I just now mention'd of Vaterus; for it relates to this question also, and indeed chiefly; turn, I say, to those which are supplied by the Cæsarean Academy (*t*), among which is one in particular (*u*), wherein every body would, the more naturally, have suppos'd the liver to be affected with a very considerable disease, because the patient had complain'd of nothing more than of a pain in that viscus. Yet in this viscus, and in the gall-bladder, was no mark of disease; but in the neighbouring part of the mesentery was found an erosion, so considerable as to equal the breadth of a span.

However, notwithstanding the truth of all these things, there was no reason, why some persons should run so much to the contrary side of the argument, as to contend that the liver, and spleen, were very rarely, if ever, to be blam'd. You will read, for example's sake, in one of the last foregoing sections of the Sepulchretum (*x*), "that nothing is more common, among the generality of physicians, than to heap up reproaches upon the spleen, as "if it were the *pancrene*, or universal fountain, of almost all diseases." And that they err'd in this we must certainly confess. Yet when it is immediately added, "that nothing is more rare than for those who examine the viscera "after death, to detect any disorder in the spleen;" if this be understood by any one, in a general sense, or in particular, as in an ascites, how distant it is from truth, will be shown, not only by the great number of observations in the Sepulchretum itself (*y*), but also by five (*z*), out of the nine, which I produc'd from Valsalva, wherein it was found either to be very hard, or larger than its natural size, or even, as in the last, from whence I took occasion to write these things, three times as large as its natural magnitude. But if the question be of the liver, you will see that, in four of them, it was either pale, or spotted, or black, or quite hard, or that it was pallid, together with the bile. Nor is it to be wonder'd at, if the disease, which, as I have already said, arises from a retarded motion of the blood, should, not uncommonly, proceed from a disorder of the viscera, through which the blood is carried slowly, and gently, by the intention of nature itself; so that if any new retarding cause be added, it cannot be mov'd but with the greatest

(*p*) Eph. n. c. dec. 3. a. 3. obs. 40.

(*q*) & cent. 3 & 4. obs. 120.

(*r*) & cent. 5. obs. 43.

(*s*) & actor. t. 4. obs. 124.

(*t*) Dec. 3. a. 5 & 6. obs. 13. & 168. & a. 6 & 8. obs. 186.

(*u*) Obs. ead. 186.

(*x*) Sect. 18. obs. 3.

(*y*) Vid. quot sub obs. 6 & 7. & alibi congerantur.

(*z*) N. 6. 10. 13. 16. 18.

flowness. Therefore, many observations are to be met with, in different authors, which you may join to those of Valsalva, and those extant in the Sepulchretum; and so many they are, that when I shall have pointed out to you a considerable number, you may take it for granted that many are still remaining, in other places. See, for example's sake, what the younger du Verney (*a*) found by dissection, in two virgins that had an ascites, and, in like manner, in a great number of bodies affected with the same disease, by the *Naturæ Curiosæ* (*b*): nor pass by the appearances found by Bechmann (*c*), in an illustrious man.

Out of all these dissections, of bodies that had labour'd under an ascites, you will not read so much as one, but you will find that the liver was diseas'd. And you will, at the same time, find it particularly remark'd, in some of them, that the spleen was, also, preternaturally affected. Nor are others wanting, from which you may perceive, that, although in this disorder "the liver was not much alter'd from its natural state, the spleen was, nevertheless, enlarg'd, and somewhat hard," or that when the liver was "quite in a natural state, the spleen was larger than usual, universally scirrhus, and so hard, that it could not be cut into, and divided, by the help of a razor, without difficulty." One of which examples is from Lentilius (*d*), and the other from the celebrated Cohausenius (*e*).

Yet I do not doubt but the disorders, which were not in these viscera, or in the pancreas, mesentery, or other parts shut up in the belly, in the beginning of the ascites, may, sometimes, be brought on, by the dropsy being long protracted. But there are, frequently, marks that these disorders had preceded, whether we consider all the bad symptoms, with which the patient was affected, before the dropsy; or some things are attended to, which occur in the dissection of bodies, as the next history will demonstrate.

20. A woman had labour'd under an ascites. During the dissection of the body, none of the cavities was found full of water, but that of the abdomen. The intestines were not distended with air. The liver was hard, and the gall-bladder contain'd a stone, which occupied the whole of its cavity. The lymphæducts did not at all appear.

21. This is one of the other observations of Valsalva, which I promis'd you in the former letter (*f*), in order, the more fully, to convince you, that the jaundice had no more been observ'd by him, than by me, to be join'd with cystic calculi. Moreover, it is but little probable, that so large a stone had not been begun a long time before, so as to arrive at such a magnitude, as to fill the whole cavity of the cyst: and, consequently, that the liver, in which bile had been for so long a time secreted, that was proper for the generation of such a calculus, had not been without disease. But as to its being expressly said that the intestines were not distended with air, that was done for

(*a*) Mem. de l'acad. r. des sc. a. 1701 & 1703.

(*b*) Dec. 3. a. 5. & 6. obs. 176. & a. 7 & 8. obs. 153. & a. 9 & 10. obs. 239. 241. 248. & cent. 1. obs. 3. in coroll. 3. & cent. 3. obs. 12. & cent. 8. obs. 27. & cent. 9. obs. 64. & cent. 10. obs. 86. & act. tom. 6. obs. 15.

(*c*) Commerc. litter. a. 1742. hebd. 32. n. 1.

(*d*) Eph. n. c. cent. 1 & 2. obs. 168.

(*e*) Commerc. litter. a. 1743. hebd. 25. n. 2. cas. 3.

(*f*) N. 25.

this purpose, I mean to show that, although the ascites and tympanites may be join'd together, this does not, nevertheless, always happen, as some seem to believe. And, indeed, as it more rarely happens that an ascites, as in the woman at present spoken of, has no dropfy of any other cavity join'd with it, so it happens less often, that the stomach and intestines are distended with a great quantity of air, in an ascites; and that in tympanitic bodies, a great deal of water, in particular, especially when the disease is not yet inveterate, is found to be extravasated into the belly. And you will see that there was very little in the woman of whom I shall immediately speak.

22. A woman about thirty years of age, was seiz'd with a great and moist scabies, after long-continu'd pains of the limbs. In order to drive this away, she, by the advice of an empiric, made use of a certain ointment. And by this means her scabies was dried up in a very short time indeed: but an acute fever arose, attended with a great heat, and thirst, and very severe pains of the head. To these symptoms were afterwards added a delirium, a considerable difficulty of breathing, a slight tumour of the whole body, but not a slight one of the belly, great uneasiness, and, finally, death on the sixth day from her having taken to her bed.

In the dissection of the body, it was observ'd that when an incision was made into the skin, and muscular flesh, no watry humour issued forth, so that it was evident the universal tumour of which I have spoken, was not of the œdematous, or anasarctous kind: and this was also confirm'd by pressing the feet with the finger, which left no traces of impression behind it.

The belly, also, was tumid, and very tense: yet when it was open'd, not water, but the intestines, and stomach, burst forth, which contain'd nothing but air; wherewith they were distended to such a degree, that the stomach fill'd more than half of the cavity of the belly. Yet into this cavity, a limpid serum was found to be extravasated, to the quantity of a pint or two: which, at first, seem'd to concrete slightly from the application of fire; but afterwards, almost like the water of the pericardium, evaporated wholly, except that in the bottom of the vessel, it left a kind of yellow pellicle.

In the thorax, the lungs were found to be annexed to the pleura, by a kind of membranes as it were, that resembled a gelatinous body: and these were so many in number, that it appear'd as if the lungs could not have dilated themselves, so freely as is natural. If you cut into them, a pellucid humour issued forth. The heart, on the right side, was connected to the pericardium, by some membranous fibres: in the ventricles was a fluid blood; yet in the right, was observ'd the beginning of a thin polypous concretion. The head it was not in our power to open.

23. The very great and humid scabies, which had freed this woman from long-continu'd pains in her limbs, being improperly repell'd, brought on death. That is to say, the acrid particles which had been accusom'd, before, to prick and vellicate the membranes of the limbs, were now salubriously thrown out, by means of little ulcers produc'd on the skin. But when these ulcers were dried up, those particles, of course, remain'd in the blood, and irritated the internal parts; and thus brought on the acute fever, and the other very violent disorders which accompanied it, and among these the tympanites. Which species of dropfy, for so the ancients call'd it, although

though it generally succeeds to long diseases, as Littre says (*g*), is nevertheless sometimes brought on in an acute disorder, as this was; and even in those that are still more acute, as I myself have seen, and shall relate to you on a future occasion.

After very violent and long-continu'd disorders, it is natural to conceive with him, that from an effete and impoverish'd blood, so great a number of spirits cannot be produc'd, nor of such a kind, as are necessary to keep up that spring and tension of fibre, requir'd in the stomach and intestines, in order to resist, sufficiently, the force of the air, in both of their cavities; especially if it be much rarefied, and in great quantity; and prevent the parietes of these viscera from being distended, in an incredible manner. But in this acute disease, the air was certainly prone to rarefaction; so that even in the vessels, which were under the skin, and through which it, perhaps, pass'd with less freedom, it seem'd, in some measure, to expand itself, and bring on a kind of slight emphysema.

Yet shall we suppose that the blood might be render'd effete, and, consequently, that the coats of these viscera were render'd weak, if not by the long-continuance, at least by the vehemence, of the disorder? Although, as it was, in this case, attended with very severe pains of the head, with anxiety, and delirium, a scarcity, and languor, of spirits were not so much to be argu'd from thence, as plenty, and irregular motions, thereof. Nor shall I, for this reason, go over to the opinion of Willis, related at large even in the Sepulchretum (*b*), who, in diametrical opposition to the succeeding judgment of Littre, accounted for the distention of the coats of these viscera, in a tympany, from a copious and irregular influx of spirits into their fibres; as if the fibres, that are dispos'd around membranous tubes, when they are inflated, would not rather constrict the tubular cavities, and resist distention.

I confess, I think it will be better to follow a third opinion, in this case, which is made up, as it were, of the two others, and suppose that the fibres, being contracted here and there, by an irregular influx of spirits, and constricted by a convulsion, had intercepted the natural motions of these tubes; and consequently prevented the expulsion of the copious and much-rarefied air: and that the air, for this reason, urging the other fibres, in those tracts wherein it was confin'd, so much the more in proportion, as it was the more increas'd in quantity, and in power, first overcame the resistance of these fibres, and afterwards of those whose strength had been left broken, and diminish'd, by the force of the convulsion; and by this means, at length, weakening and relaxing all the fibres, universally dilated these tubes. And that the fleshy fibres of the intestines may be so convuls'd, as to prevent all exit to the intercepted air, the very close contractions of the intestines, which are frequently met with, here and there, in dissections, plainly demonstrate.

Many observers tell us, "says the celebrated Corn. Henr. Velsé (*i*)," and I have frequently seen, in bodies after death, "that when the intestine is in one part lax, soft, distendible, and flaccid, it is in another place,

(*g*) Mem. de l'acad. r. des sc. a. 1713.

(*b*) Sect. hac 21. in schol. ad obs. 22.

(*i*) Disp. de mutuo intest. ingressu p. 1. §.

14.

"hard,

“ hard, contracted, and rugous, so that it could not be more closely shut up, and streighten’d by the compression of the hand, and would not admit any fluids to pass through it, but nearly resembled a solid mass of flesh.” And after having said that these constrictions “ were sometimes alternate, through the whole tract of the intestinal canal,” as he saw in the body of an infant, he proves by his own observation (*k*), which is as follows, what elastic air, when shut up, and more and more expanded, by reason of the heat of the place wherein it is confin’d, can effect. His words are, “ I saw in the body of a girl of two years old, a portion of the intestine colon so exceedingly enlarg’d, by the included air, that it resembled a bladder consisting of coats, which, on account of their great elongation, and distention, were extremely pellucid, the remaining tract of the same intestine, both above and below this tumour, being externally furrow’d by this very great contraction, and altogether impervious.”

To this I would likewise have you add the equally impervious contraction, which was seen by the excellent Bafius (*l*), between the upper and lower parts of the colon, in the body of a man, which parts were greatly distended with air. And that when constrictions of this kind are relax’d, as of course happens in those who are to recover from their diseases, the fibres are now consequently become very weak, under so great a pressure, I have no need to inculcate upon you: nor yet that those certain tracts, in which there had been either constriction or air, would be instantly expanded with the whole force, and spring, of this elastic fluid; and that so much the more, in proportion as these constrictions have been stronger, or continu’d for a greater length of time.

You, therefore, will not wonder, if in the observation of Laubius (*m*), the stomach was corrugated, but the colon distended to such a degree, “ that a very robust and muscular man could easily have thrust in his whole arm,” or that LITTLE (*n*) often saw the cæcum, and the colon, of the thickness of a man’s thigh, and that PLATERUS (*o*), even in a boy, saw intestines which seem’d, “ in some places, to be equal to” the same thickness. On the contrary, there is, at other times (*p*), so very great a distention of the stomach, beyond that of the intestines, as not only to be suppos’d to have forc’d the contiguous part of the liver, and the diaphragm, much higher than their natural situation, but also to have prevented the descent of the latter; and sometimes to have thrown the patient into such imminent danger, for this reason, as to require an instantaneous, and hitherto unthought of, remedy: so that an exit might be immediately contriv’d for the air, by means of thrusting down an oblong needle, through the left hypochondrium, into the stomach. But of this below (*q*).

However you might have observ’d, in respect to the woman describ’d by VALSALVA (*r*), how much the stomach was distended. From whence I have taken occasion to explain the tympanites in certain cases, not without previous convulsive constrictions. But if you should choose rather to make use

(*k*) Ibid. §. 15.

(*l*) Dec. 3. obs. anat. 9.

(*m*) Act. n. c. tom. 2. obs. 20.

(*n*) Mem. cit.

(*o*) Sect. hac Sepulchr. 21. obs. 22. §. 4.

(*p*) Act. cit. tom. 1. obs. 49. cum schol.

(*q*) N. 25.

(*r*) N. 22.

of the explication of Littre, in all these cases, I shall be the less repugnant to your determination, as in the progress of all we must, nevertheless, return to this, if what I just now said be really just and true.

24. And thus the causes of a tympanites, both after a chronic, and in an acute disease, will be understood, when the quantity of rarefied air, and its expansive force, shall distend the intestines, and stomach, and consequently the abdomen, which lies in apposition therewith. But there is, also, another species of tympany, when the same air, being rarefied, on the outside of the cavity of these viscera, extends the abdomen itself only. And the muscles of the abdomen, which were even created for this purpose, among others; that while every thing is in a natural state, these viscera might not be distended beyond measure; are so far from resisting their distention, when they are more lax than they ought to be, from any cause whatever, that it even appears reasonable to number them among the causes of this distention being very considerable, and happening very easily. But when the air, on the outside of these viscera, shall urge the lax abdomen, this will be so much the sooner, and so much the more, extended in proportion, as it will have no resistance to its force, from the parietes of the intestines and stomach, but only from the parietes of the abdomen itself.

Yet this species of tympany is not frequent, either when alone, or join'd with the former; but is even so rare, that neither Willis (*s*), nor Littre (*t*), have seen it: and the first has even said that he could not conceive of it, and the other that it was entirely refuted by his experiments. I, however, would neither deny the truth of any thing, because it could not be properly conceiv'd of, nor would suppose that what does not happen in many, cannot happen in some: and perhaps the opinion of these excellent men was nearly the same, only not sufficiently explain'd. Yet others do not doubt, that from humours extravasated in the belly, and there corrupted, air may disengage itself, especially in those bodies wherein, from the effect of disease, it is not well "and intimately mix'd with the humours," or, in like manner, from any corrupted viscus; or finally (which is the most easy of all) that it may issue from the intestines, which are perforated in some part or other of their tube.

And I said that this method was the most easy, because the celebrated Haller (*u*) observ'd in intestines, extremely distended by the force of this disease, that the air had made a passage for itself through their parietes, quite into the cells which are situated under the external coat: and, indeed, I remember that the celebrated Spoeringius, in the commentaries of the Royal Academy of Sciences in Sweden, I think, in the year 1742 (for when I wrote this letter the book was not in my hands) has said, that in a man, whose intestine colon was full of excrements, the air had so far expanded the cavity, above this obstacle, that by the force exerted upon its membranes, it was no longer contain'd in any of them, but the external; so that it is easy to conceive, how little yet remain'd, to prevent it from bursting forth quite into the cavity of the belly, from that of the intestine.

(*s*)(*t*) Locis indicatis n. 23.(*u*) Opuſc. pathol. obſ. 26.

Yet not only the air, but erosion also, or gangrene, by perforating the intestines, may give an exit to the flatus, as they have more than once done, from the stomach. Thus in the two observations, which are mention'd above (*x*), of Camerarius, and Hoyerus, it is not at all surprizing that, as the stomach had been perforated, no sooner was a slight incision made upon the tumid abdomen, but first of all the flatus burst forth with an explosion, and putrid smell. Yet that the same thing may happen, even when the intestines are not pierc'd through, other observations show; whether they are affected with a gangrene, as in the writings of Mead (*y*); or whether they incline to a gangrenous state, and at the same time are externally cover'd over with a deprav'd humour, and internally turgid with flatus, as in the writings of the celebrated Gullman (*z*); or whether there be nothing of this kind, except that they, and the stomach, are both of them inflated to a very violent degree, as observ'd by Mercklinus (*a*); or, finally, not even this is the case, but the intestines "are just in the same state as those of a healthy person," as is remark'd by the celebrated Heister (*b*).

But in these two cases, and in other cases of the same kind, if any other chance to occur, by what passages shall we say that the air came into the cavity of the belly? It must be confess'd, that there may be some other different passages, at different times, which we are not, at present, acquainted with. But yet, as we, sometimes, see certain flatulent tumours in the viscera, why cannot the air be collected together, in the cavity of the belly as it is elsewhere? The gall-bladder, for instance, was found very turgid with air by Jo. Bapt. Fantonus (*c*), in consequence of that fluid being shut up under the external coat; and his celebrated son (*d*) has, more than once, seen, as others have also, almost innumerable little vesicles of different sizes, under the external membranes of the liver, spleen, and, in particular, of the mesentery: and he conjectur'd that, as water continuing to distill from ruptur'd hydatids, into the belly, make an ascites, so air bursting forth from these ruptur'd bubbles, if it does not cease to rush into the abdominal cavity, upon its separation from the blood, will bring on a tympanites.

Yet if we even could not understand the causes of this effect, the effect itself certainly could not be denied. For he affirms that he had seen just the same thing in a young woman, as Ballonius saw in a girl (*e*), I mean that the tumefied abdomen being prick'd after death, had entirely subsided with an explosion. And that the same thing as happen'd to Ballonius, had happen'd to others also, and among these to Vallesius, you will learn from the Sepulchretum itself (*f*); and, at the same time, who found air in the cavity of the abdomen, when the intestines were distended therewith (*g*), or when water was effus'd into the belly: and whom you may add to these you sufficiently perceive, from the later observations that I have just now mention'd.

(*x*) N. 19.

(*y*) Monit. med. c. 8.

(*z*) Eph. n. c. cent. 7. obs. 89.

(*a*) Earund. dec. 3. a. 3. obs. 142.

(*b*) Earund. cent. 5. obs. 84.

(*c*) Obs. med. 18.

(*d*) In schol. ad eam, ult. edit.

(*e*) Hic in Sepulchr. obs. 23. §. 2.

(*f*) Ibid. §. 1.

(*g*) Ibid. obs. 22. §. 4. & in additam. obs. 75.

25. And lest you should suspect these things to have happen'd, because some intestine was prick'd, together with the peritonæum, as by their distention they were quite in contact therewith, and become very thin in their parietes, attend to these circumstances; that where there was an ascites at the same time, water was, of course, interpos'd betwixt the peritonæum, and intestines; and that where there was no ascites, it would be difficult to be done, without some marks of a perforation in the intestine being discover'd then, or afterwards; none of which, when it happen'd to me, at any time, to observe the same thing, I could find out, by the most accurate attention. To this add, that many of the observations, in the Sepulchretum (*i*), will teach us, and reason itself will confirm, that upon slightly perforating an intestine, the air, indeed, which is nearest to the foramen, bursts out, but that the air which is at a distance, and distends the remainder of the intestines, either does not immediately come out, or if it does soon issue forth, does not, however, escape with such celerity, that the subsiding of the whole belly should seem to be the consequence, in one instant of time, in the same manner as happens in the explosion of a bladder; and as, from the due consideration of the words of those great men, whom I just now commended (*k*), you will readily acknowledge that it was seen to do by them.

Or if you do not grant this, and will, absolutely, contend that at the very point of time, in which any intestine is slightly punctur'd, all the air rushes out of the intestines; tell me then, I beseech you, how it could happen, that Gullmannus (*l*) saw them, soon after, turgid with flatus, or how that Mercklinus (*m*) (after the air had burst forth from the abdomen, when but slightly punctur'd, and this "had immediately subsided) saw, on examining the " viscera, the stomach, together with all the intestines, immensely distended " with air, like the most inflated bladder."

To this add the observation given by Heister (*n*), in order " to decide this controversy. In a woman who " had the abdomen extremely distended, and " who died suddenly," the same thing happen'd which I have said was seen by Mercklin, " as soon as ever a very small wound had perforated the " peritonæum;" but the intestines were not found to be expanded with air; and this was even the body, in which " the intestines were just in the same " state, as those of a healthy person. I will not here say, that if they had been previously distended, to such a degree, by the included flatus, some of them would certainly have retain'd the marks of this distention, whether you consider'd their thickness or their situation. But this one thing I will say, that as so many physicians, and surgeons, of Amsterdam were present, and amongst them that very great anatomist Ruyfch, besides Heister himself, who was a young man indeed, but even then excellent in the same art, I cannot be persuaded to believe, that if any thing, beyond the peritonæum, had been cut into, some one or other of them would not have immediately found it out.

I suppose you scarcely expect here, that in these, and other observations of this kind, made by the most celebrated authors, another suspicion should be

(*i*) Obf. 75. cit. & obf. 22. §. 2. & cæt.

(*k*) N. 24. ad fin.

(*l*)

(*m*) N. eod.

(*n*) Ibid.

obviated, I mean that the air with which the abdomen was distended, had, at length, been extravasated into the cavity of the belly after death; for the tumour of the belly; in those we speak of, had existed long before, while they were living. And that those vesicles fill'd with air, which I have taken notice of with Fantonus (*o*), might even exist in the living bodies, the flatulent external tumours, which are acknowledg'd by most surgeons, in the scrotum of diseas'd bodies, while living, and in other parts, and were formerly number'd by Gorgeas, among umbilical herniæ, as you will read in Celsus (*p*), will sufficiently teach us.

It does not escape me, what doubt there may be in the last place. But I do not at all doubt, that from a small quantity of humour, stagnating betwixt coats, a great quantity of rarefied air may sometimes extricate itself: and when I resided at Venice, either every thing deceiv'd me, and not only me, but the most experienc'd surgeons, and physicians, or a tumour, which was not narrow in its circular circumference, and had form'd itself under the common integuments of the abdomen, in a certain barber, and which I afterwards saw perfectly heal'd, was made by included air. Nor do I easily see how I could explain those tumours, which that celebrated man, Daniel Hoffman (*q*), observ'd, in the day time, in a certain lying-in-woman, running about under the very surface of the abdomen, of various sizes, and dilating themselves with a noise, but disappearing about evening, and that for some weeks together. But I know for a certainty, that the inflation which the younger du Verney (*r*) saw in the last disorder of a girl, increasing with an undulating appearance, till it at length occupied the whole trunk of the body, and, as you press'd it, giving the sensation of air, as it were, under the finger, moving away with a kind of crackling; this, I say, I know, for a certainty, to have been from air expanding itself under the skin; for scarcely was the skin of the abdomen cut into, but an intolerable stench burst forth, and thus the whole tumour vanish'd.

Yet I would have you, as to what relates to windy tumours, read over those things that are publish'd on their production, by Littre, in the history of the Royal Academy of Sciences at Paris (*s*). And in the commentaries of the same academy (*t*), you will find some things propos'd by the younger du Verney, in order to distinguish the second species of tympany, which is sometimes join'd with an ascites; and, at the same time, to prevent us either from pronouncing a tumour of the abdomen to be an ascites, rather than the first species of tympany, on account of some similitude of fluctuation; or, on the other hand, from denying it to be an ascites, because there is no sense of fluctuation: and some of our observations may, also, serve to make you cautious in this respect (*u*). And that very excellent physician Werlhofius (*x*) has given some useful hints on these subjects, showing how the tympanites, especially when it has become inveterate, does not exclude a sense of weight.

But in regard to the method of cure, when you read that a tympanitical inflation of the abdomen, which had already continu'd eight years, was re-

(*o*) Ibid.

(*p*) De medic. l. 7. c. 14.

(*q*) Commenc. litter. a. 1737. hebd. 11.

(*r*) Mem. de l'acad. r. des sc. a. 1704.

(*s*) A. 1714.

(*t*) A. 1703.

(*u*) N. 30.

(*x*) Commenc. litter. a. 1735. hebd. 36. n. 4.
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mov'd, merely by taking away a large quantity of blood, from the foot, by the celebrated Michael Adolphus (y), who confesses "that it was not from "flatus," you will judge, from what then, it did arise. And how difficult it is to cure either species of the tympanites, that is really flatulent, nothing more clearly shows than the remedy, which men of eminence have been under a necessity of devising, I mean the paracentesis. But not one of the more cautious surgeons has yet been found, that I know of, who was willing to thrust a perforating instrument into the abdomen, without knowing what parts he might wound. In the number of these cautious surgeons he certainly was not, who, having formerly mistaken a tympany for an ascites, and having under the inspection of Van Helmont (z), who was then a young man, perforated the abdomen, in vain expected the exit of the waters. For "having "withdrawn the trocar, the abdomen immediately subsided, and the patient "perish'd soon after: and the flatus, which was discharg'd, was exceedingly "offensive, and of a cadaverous smell." And although the body of the patient was not dissected after death, yet nothing can more easily happen, than that upon drawing out the needle, the air rushing forth, may sometimes bring on a slight alleviation; but then nothing can more easily happen, likewise, than that, soon after, other things, also, may come out of the intestines, and flowing down into the belly, speedily bring on a fatal disorder in the viscera.

And what will you say to this? That the needle might be fix'd into that part of the intestine, wherein, though there was suppos'd to be the greatest quantity of air, on account of the very great distention, yet there was, in fact, the least; for a great quantity of air is not always in the intestines of tympanitic patients, and but little matter, and this for the most part viscid, as it happen'd to Littré (a) to observe. For the younger du Verney (b), on the other hand, found the intestines half full of matter: and the celebrated Leonhardus Hurterus (c), having wonder'd that in a tympanitic boy, the large intestines, in particular, were so distended, that the colon had dislodg'd the liver, in some measure, from its usual situation, and driven it to the left side, found, within the cavity, a sufficient quantity of matter, to produce this effect; this matter being very thick, spumescient, and of a white colour, degenerating to yellow: which is a circumstance chiefly to be conjectur'd, in a disorder that is attended with a costiveness, when the patients have either taken in a great quantity of food, before the disorder began, or have gone on to take it in a considerable quantity, after it has begun.

But what danger there might be in perforating the abdomen, in order to cure the other species of tympany, if the first species should happen to be join'd with it, or the first should be taken for the second; and it is very difficult to distinguish one from the other; you understand from those things which have been just now said.

Yet of this, and of the general method of cure, in a tympany, and of dis-

(y) Act. n. c. tom. 1. obs. 244.

(z) Ignor. hydrop. n. 44.

(a) Mem. de l'acad. r. des sc. a. 1713.

(b) A. 1703.

(c) Eph. n. c. cent. 1 & 2. obs. 184.

tinguishing one species from the other, as far as it is in the power of conjectures to do, and of the nature, and causes of this disease, I would have you read what the celebrated Zeviani (*d*) has learnedly, ingeniously, and skilfully written; for if, from his very great regard, and friendship, to me, he would have these writings appear in my name, such as it is, he had been able to send them to me, before this letter was dispatch'd to you, some things would not have been wanting herein, which, in the present case, have escaped me. You will, therefore, turn to them in his writings. For I now go on to add to the many observations of dropsy, which I have describ'd from Valsalva, some of my own, but not a great number, lest this letter should grow out into an enormous length.

26. A certain man labour'd under an ascites, but still more under an anasarca; and this seem'd to be the more considerable, because, as it did not occupy the face, which was emaciated, and the remainder of the head, the other limbs, especially the lower, seem'd to have, when compar'd with the head, a most monstrous magnitude. This man dying in the hospital of incurables at Bologna, in the year 1704, if I rightly remember, I dissected him rather in order to enquire into the nature of the anasarca, than of the ascites. And I made my enquiries in the thighs, and the scrotum, for the legs began to be putrefied. The cuticle of the thighs was here and there rais'd up into bladders, by the water which lay underneath it: one of them was of the bigness of my fist. Having cut quite down to the bone, I examin'd the sections, and found that the adipose membrane was much thicken'd; and that the cellulæ malpighianæ thereof, were fill'd with a watery fat, or rather with water, in the chief part of them, which, by reason of the great number of small membranes of the cells lying betwixt, resembled a jelly, as I have said in the *Adversaria* (*e*). And as the adipose membrane is propagated, not only betwixt the muscles, but also betwixt the fasciculi of fibres of which the muscles are made up, so in all these places was the water likewise propagated, having the same gelatinous appearance. Nor did I meet with any other appearance upon cutting into the scrotum, which was extremely tumid. For the cells, in particular, of which the dartos is compos'd, as they are continu'd from the adipose membrane, were distended with water. The water therefore issued from these, and all those other sections, and if you pleas'd might even be easily press'd out; but not entirely; for some considerable quantity remain'd betwixt the little membranes of the cells.

Wherefore, transferring the knife to the abdomen, although I found scarcely any water between the integuments thereof, yet I did not believe that it had so soon flow'd down through the sections of the scrotum, and thighs; but I rather thought that by the large quantity of waters which fill'd the belly, and distended the abdomen, the water was forc'd out of the integuments of this cavity, which would otherwise have stagnated there, and carried down into the lower limbs; and this while the patient was living: or if you choose rather to consider it so, when it was about to ascend from these limbs, it was not admitted betwixt those integuments by reason of the same pressure there-

(*d*) Del flato, &c. l. 2. c. 28. & l. 1. c. 27. (*e*) II. animad. 16.

on from the waters beneath, that I mention'd just now. But in what state the viscera of the belly were, I did not accurately remark; for, as I said before, I did not at that time propose making this enquiry.

27. You see then, that the seat and cause of the tumour, which is made by the anasarca, are not only under the skin in the adipose membrane, but also in all the appendages of that membrane, especially where the swelling is considerable; so that as, besides this membrane itself, these appendages are likewise distended, and that not only betwixt the external muscles, and those that lie beneath them, but even betwixt the fasciculi of the fibres of these muscles, a large tumour is consequently generated. You see, at the same time, what it is that frequently imposes upon observers, by the appearance of a jelly; for the same little membranes, lying betwixt the portions of pinguedinous oil, are the reason of its appearing less fluid, in sound and healthy bodies, than it really is in the living body.

Yet I would not deny that, either by reason of the remains of this oil being interpos'd, or because the confin'd water is very viscid, or because by stagnation, and the season of the year, it becomes pretty thick, there is, sometimes, something besides these membranes which offers that appearance to our eyes. That the last supposition was the only one approv'd by Glaferus, you will learn even from the Sepulchretum (*f*); though others seem rather to have prefer'd that which I prefer, and among these Peyerus (*g*) and Wepfer (*h*).

28. In dissecting an old woman who had died of an ascites, though not a very considerable one, in the hospital at Padua, about the end of the year 1716, I observ'd these things.

The belly, when the water was all exhausted from its cavity, show'd the liver to be beset, inwardly and outwardly, with many white, but not very hard, tumours; and in the pancreas was one similar tumour, but harder, and much more large, as it occupied all that part of this viscus, by which it is connected to the intestinum duodenum. The proper membrane of one of the kidneys (for I did not examine the other) was become much thicken'd, and was easily drawn off by the hand: the little tubuli, or small canals, were, also, much thicker than usual, and for that reason much more evident.

The uterus was not diseased internally. But externally, it show'd, in one side, a conspicuous cicatrix, as if from a wound, whereas there was none in the skin of the belly: and on the opposite side, not far from the cervix, it protuberated into a roundish tumour; which being cut asunder, together with the paries of the fundus, that lay beneath it, and in great measure inclos'd it, exhibited a substance of a red colour, inclining to livid, and yet not harder than the other part of the uterus. In the testes were thick, white bladders, which contain'd nothing in their cavity: but one, which was much larger, contain'd a watery humour.

The thorax was sound, except that it had some water extravasated in it, but not in great quantity. The brain was in a natural state, firm, and had not the least water contain'd therein.

29. There was sufficient cause, not to speak of other things at present, in the pancreas, and liver, not only that the chyle and blood should not be pre-

(*f*) Sect. hac 21. obs. 21. & schol.

(*g*) Ibid. obs. 3. §. 1. & schol.

(*h*) Ibid. obs. 17. §. 5.

par'd, agreeably to the intention of nature, but also that the motion of the lymph and blood should be retarded in the belly.

It once happen'd to me, that when I walk'd into the country for the sake of refreshing air, and meditation, I met with a flock of sheep, out of which the butchers were buying some at a very equitable, and others at a very low price. When I enquired into the reason of this difference, these, said they, for which we give the higher price, are sound, but the others have a hard liver, and water in the belly. As the belly was not more tumid in the one than in the other, and no other mark of disease appear'd, that I could observe, I should have supposed that they had not spoken from real knowledge, if I had not been convinc'd, soon after, from seeing some of these unsound sheep kill'd and open'd. And they had made use of this mark to judge by. Lifting up the upper eye-lid of the sheep, and attending to the colour of the parts, that lie about the eye, they distinguish'd the sound sheep by the red colour, and the morbid by the white: thus, as the other part of the body is cover'd with hairs, they examin'd the parts which were not cloth'd therewith, just as physicians do the face; and that with so much the more advantage, as a greater number of vessels, and those which are very conspicuous, lying in that part, more clearly show what the nature of the blood is.

I should not have related these things to you, if I had not lately seen that Boerhaave (*i*) refers to the very same mark, and expressly transfers it from the brute creature to the human; so as to assert, that by the pallid colour of the tunica adnata, and the caruncle of the eye, "a watery cacochymia is signified;" and as we know from this sign, "that there is a deficiency of red blood, that all the disorders are present which are the consequents of such a defect." At least many of these may be present, or follow not long after.

So among the sheep, that I have said were inspected by me, at that time, there was one, which, although it had no better a liver than the rest, nor was less dropical, was nevertheless very fat, the fat being white and solid, and the omentum very fine. That is to say, the disorder in this sheep was very recent: but if it had liv'd so long as the others had done, under the influence of this disorder, it would not have been furnish'd with so fine an omentum, and so good an appearance of fat. For in such a habit of body, fresh disorders are continually added to the first; as you may see even in the bodies of men, to which I return: for in the dissection of such bodies, the viscera, for the most part, are so much the more diseas'd, in proportion as they have been longer macerated by the dropsy, or by the disorders that precede the dropsy. I will give an instance of each case: and first of the second.

30. Caspar Lombria, a Venetian nobleman; of a bilious temperament, as the manner of speaking is, of a large and robust body, and, for that reason, so much the more careless of all medical precepts, in every method of life; after having pass'd his fortieth year, was seiz'd with a long disorder which appear'd in different shapes, and having made use of cooling liquors, during this disease, to an immoderate degree, escaped from it indeed, but with his belly somewhat more tumid than natural. Yet this being remov'd by the

(i) Prælect. ad instit. §. 868.

help of remedies, he had no symptom that deserv'd any great attention, till a kind of diarrhœa began to affect him, and return at intervals, sometimes with considerable violence.

By these discharges the thirst, which was, at other times, almost natural to him, was increas'd; and his urine, which he us'd to make in large quantities, grew very saturated in its colour, and very much diminish'd in its quantity. Yet his strength was not at all injur'd hereby, till about the latter end of the winter of the year 1722, which was the forty-seventh year of his age, when he was troubled with the diarrhœa for almost a whole month together; a matter of various colours being discharg'd, and for the most part crude, ferous, and frothy: whereas it us'd, before, only to hold him for eight or ten days, in which time he discharg'd a great quantity of yellow and fluid matter.

This diarrhœa being overcome by the help of proper remedies, return'd, soon after, even more violently, by the neglect of regularity in living. Again was this disorder remov'd; when a tremor, with which he had been slightly affected from his infancy, and which after that first illness became very manifest through his whole body, and was now and then made more violent from the intestinal fluxes, began to be attended with some new disorders of the head.

The physicians having, for a long time, forbid the use of generous wines, on account of this tremor; though their orders ought to have been more punctually obey'd; and having permitted him to lose a small quantity of blood, on account of these new disorders, they saw, on the upper part of it, after concretion, a crust, which was, in one half of it, of a green colour. Yet by making use of a proper method of cure, his strength, colour, and appetite for food, seem'd to be restor'd, and he made water in a very proper quantity, when the patient began to be tir'd of the medical regimen, which had been of so much advantage to him, and would make no farther use of it after the thirtieth day. Nor was it that he omitted these remedies only, but he had violent commotions of mind, and great exercises of body. And these were succeeded, within fifteen days after the omission of his medicines, by the beginning of a fatal disease. His abdomen, which, before, us'd often to swell with a great quantity of flatus, but to be reduc'd soon after, began now to be tense, with a continual, and very uneasy tumour; and when struck with the hand, to resound like a drum: his feet were also a little swollen: his urine was of a very high colour, and in very small quantity: his thirst was very troublesome.

These things being observ'd in the latter end of May, and Michelotti, who had begun to use all his art against this tympanites in vain, being oblig'd to set out for France, before the middle of June, with the Venetian ambassadors, earnestly recommended the patient to me, as he was coming to Padua at the same time; so that if I could not constantly see him, together with his physician, I might, at least, when other occupations suffer'd me, frequently assist him by my advice. I however, not yet having seen the patient, only from attentively reading those symptoms that I have describ'd to you briefly, conjecturing that there was a disease in some of the viscera, in others a weakness, despair'd of curing him: nor did I conceal this from his relations, who very well knew that for the space of seven years past, he had scarcely ever
been

been without a disease; and upon my enquiry confirm'd that which is said in the latter end of the books *de Morbis*, "that he had fallen into this disease, "when his body had been melted down by another."

Therefore, I said expressly the same thing to them, that is immediately added there: "if then the patient has been suddenly seiz'd with this disease, there is no doubt but he will die in consequence of his having been so long afflicted with another." Nor was my opinion at all different, after having seen the patient: and into this opinion, after that, came all the physicians who were the most eminent, at this time, in Padua. For although flatus having been sometimes discharg'd both above and below, the abdomen resounded no more if you struck it with your hand, yet the swelling thereof, and the other symptoms that have been mention'd, were so far from decreasing, that they were even increas'd every day, whatever method of cure he was put into; so that the patient did not seem, now, to have brought hither a tympany, but a speedily-increasing ascites, to which a dropsy of the thorax, and, finally, a dropsy of the brain was added, as you will know from those symptoms that I shall subjoin.

In the first place, if laying your left hand on the side of the abdomen, you struck the opposite side with small, but repeated, strokes of your right hand, you perceiv'd the fluctuation of the water striking against the left hand. Yet after a few days, the belly was not only full of water, but immoderately tumid, and by its distention gave resistance to the hand which endeavour'd to make an impression upon it: and, at the same time, not only the feet, and legs, had an cedematous swelling, but the thighs, also, were very turgid, the face, and the upper limbs, becoming quite emaciated. In the beginning he had a kind of cough, and afterwards none: but although the patient could at first lie on which side he pleas'd, he could lie, afterwards, only on the right: and although he could lie down in his bed, through the whole course of the disease, yet twice, before the last weeks, he was compell'd to leap out of bed, by a sense of suffocation coming on, which went away as suddenly as it had come.

At length, on the last ten days he was, for the most part, affected with a kind of sleep, and frequently with a little delirium, but only such as was very slight. Then, also, the force of the heart, which had for a long time been very strong, began to be very weak, at times: but the strength of the other muscles did not fail, even almost to the last. If you except two fevers, which had attack'd him many days before death; the first not without long shiverings and tremblings, which however ended within two days; and the second more slight, and more short; I say, if you except the time of those fevers, the pulse discover'd nothing preternatural, except that frequently, and, particularly, about the evening, it was found to be pretty quick, and his flesh pretty hot.

In the beginning, there was a very troublesome sensation in the epigastrium, and even a pain betwixt the ensiform cartilage, and the navel; which, afterwards, was not perceiv'd in that part, but here and there throughout the belly: and a sense of pricking remain'd in the region of the liver. His sleep, and appetite for food, which in the beginning had been moderate, were often deficient in the progress of the disease: and his thirst was still more and more violent.

violent. The intestines, spontaneously, discharg'd a great quantity of matter, which was, for the most part, fluid and yellow; and sometimes the stools were of a different colour, and viscid. On the other hand, the urine was always in very small quantity, of a flame-colour, and saturated. As the patient, the relations, and the physicians, desir'd nothing more earnestly, than that the urine should be discharg'd more freely, I can hardly say how many different remedies he took for this purpose. I believe there was no medicine whatever, whether weak, or powerful, simple, or compound, which comes from any of the three kingdoms, to speak in the manner of naturalists, that was suppos'd to have any tendency of this kind, but was propos'd by one or other physician out of such a number, and taken by the patient.

But all were of no effect, as generally happens where nature, itself, does not co-operate with the physician; for his urine was never, in the least, increas'd in its quantity, or chang'd in its appearance, except that about fifteen days before death, and again, on the last days of his life, it deposited a little quantity of something, of a tobacco colour, in the bottom of the vessel; which, upon diligent examination, I found to be blood mix'd with ichor, and this I demonstrated to those whom it concern'd, that they might, at length, put some stop to the use of diuretics. Some of these, but at a time that was less inconvenient, and such as were less to be suspected, I had also recommended, not with the hope of curing, but lest the patient should perceive that I despair'd of his case, and among these some of the turpentine kind.

But as I observ'd that the urine had not gain'd even that violet odour, which it generally does from the use of these remedies, I distrust'd them, and even the passage of the kidneys still more than before; and thought it was better to return to the intestinal passages, especially as the medicine call'd purified tartar, which we us'd at intervals, caus'd a considerable discharge, and often a very watery one, without any inconvenience, and always brought on an alleviation of some hours, from a troublesome kind of sensation, which was perceiv'd at the region of the stomach. Yet even this method was of no advantage.

The patient had heard, from Michellotti, that the urine of a heifer had succeeded with him, more than once, in the cure of an anasarca. As he was, therefore, desirous of trying, though neither the time of the year, nor some other circumstances of this kind, were such as L'emery (*k*) would have prefer'd, yet I indulg'd him in the use of a remedy, of the same kind as “the urine of sheep, or the urine of asses;” which, as I had read in Avicenna (*l*), were formerly recommended, by some physicians, against this disease; and which, finally, not only discharges the water of patients in an ascites, by the kidneys, but also by the intestines, as the observations of L'emery inform us: I indulg'd him, however, with this restriction, that he should not drink more than seven ounces on the first day, and should add two ounces every day afterwards. And on the first day, he felt an effect which L'emery has not taken notice of, in the recital of others.

(*k*) Mem. de l'Acad. r. des sc. a. 1707.

(*l*) Canon. 1. 3. Fen. 14. tr. 4. c. 13.

For a little after he had taken it, his head was affected with a kind of drunkenness, which, however, went off soon afterwards, and did not return on the following days, although a greater quantity was taken. On the fifth day, the patient went so far as thirteen ounces, yet did not make more water, but discharg'd a greater quantity by stool, so that, on this very day, he discharg'd water to the quantity of four or five pints, without any loss of strength: yet was no other kind of relief observ'd therefrom, than what had been observ'd from the tartar; the belly not being at all less swell'd, and the lower limbs even becoming more tumid. For which reason this remedy was then intermitted. Some time after, the patient would return to the same. He drank every day, successively, for five days together, eight ounces. But found it of no more service than before: and indeed, upon being attack'd by the second fever, which I spoke of above, was oblig'd entirely to omit it.

In vain also; and I wish I could say without injury, in a disease, which it was much more easy to increase, than diminish; in vain, I say, did he use other remedies of the same kind, whether they were taken in by the mouth, or in the form of glysters, or lay'd upon the abdomen. For when a certain senior physician had order'd the juices of dwarf-elder, and wormwood, to be applied to the belly, it had no effect, but to bring on a fruitless desire of going to stool, and an itching of the skin about the region of the liver, where the small veins appear'd livid. He therefore gave up the use of these juices, nor did he find any application to the abdomen of use, if the pains of the belly at any time required to be asswag'd, but the omentum of a weather-sheep smear'd over with the oils of violets, wormwood, and almonds. But this was more early in the disease. Now let us go on to the end of the disorder and the dissection. He died like a suffocated person, with his face and shoulders very livid: but water and blood came out of the mouth and nostrils of the body after death.

The body was dissected the day after, which was on the third of August, in the year before mention'd, in order to be embalm'd. The upper limbs were mark'd with a kind of livid petechiæ. And from the lower limbs, an œdematous tumour was produc'd through the back, quite to the scapulæ.

The belly contain'd a quantity of foetid water, of a green colour inclining to yellow, with which the parietes were distended to their utmost capacity. In this water, swam some pieces of purulent substance, which I suppos'd to have come from the omentum, though they seem'd to be mucilaginous. The stomach, and the intestines, which were scarcely at all turgid, were of a black colour, as the mesentery was also. The liver was hard, internally, and externally consisting of tubercles, that is of glandular lobules, which were very evident, and evidently distinct from each other: yet it was not larger than its natural size. But the spleen was large, and of a compact substance, and, when cut into, discharg'd not the least blood. One of the kidneys contain'd ichor in its pelvis.

In the thorax, and particularly on the right side, was a great quantity of water, of the same kind with that in the belly. So in the pericardium also, in which, however, there was no great quantity. The lungs were turgid and

and blackish in their colour. The heart was without blood, not to say without polypous concretions.

The head, as the body was embalm'd, in order to be carried no farther than Venice, to be laid in the family vault, it was not necessary for us to open; nor, indeed, were we at liberty to do it.

31. Since the time that Joannes Posthius, as you have it here in the *Sepulchretum* (*m*), found the substance of the liver, in an ascites, "universally granulated internally, the granules appearing every where like peas, both as to figure, and number," many other similar observations have been made upon the same disease. Four others are extant in the same place, one of Wepfer's (*n*), to whom the liver "appear'd like a body conglomerated of a great number of glands," a second of Ruyfch's (*o*), a third of Brown's (*p*), a fourth of Hartmann's (*q*), to whom the same viscus seem'd to consist, in the whole of it, merely of large glands," or "of glands," or "of lobules." And the smallest parts of the liver cannot be so enlarg'd, but they must be injurious to the function of this viscus, and much retard the motion of the blood through the belly; either by compressing the other parts which lie between them, or, at least, by compressing the sanguiferous vessels.

Wherefore Posthius, and Brown, in vain drew off the water, which would be frequently resupplied, when "the liver was diseas'd," as Erasistratus admonish'd in the works of Celsus (*r*). For as to what Celsus replies thereto, "that when the water was drawn off there was room made for remedies," to bring back the liver to a sound state, this disease of the liver is certainly not of such a nature, as to admit of medicine. And although this appears only by dissection, yet there are so many diseases, both of this and the other viscera, which do not admit of a cure, that when there are symptoms of the viscera being injur'd, we must not run, heedlessly, to prescribe the evacuation of the waters. For which reason, in the case of this noble patient, of whom I have been speaking, no one, out of such a number of physicians, ever propos'd it.

But as to what many, in conjunction with Ballonius (*s*), and our Sanctorius (*t*), are afraid of, lest the inflammation of the peritonæum, intestines, and a gangrene, should be the consequence of evacuating the waters, they may seem to fear it with great justice, to those who read over the examples of cases, wherein the water was drawn off, many of which are related in the *Sepulchretum* (*u*). And to these you will, in the first place, add that famous instance, which the celebrated Scherbius (*x*) has describ'd, of a man, in whom a calculus form'd in the receptaculum chyli, and opposing itself to the quick ascent of the chyle, and of the lymph, into the ductus thoracicus, had brought on an ascites of such a kind, that the water was drawn off by

(*m*) S. 21. obs. 4. §. 21.

(*n*) Obs. 32.

(*o*) In additam. obs. 34.

(*p*) Obs. 49.

(*q*) Obs. 50.

(*r*) De medic. l. 3. c. 21.

(*s*) In schol. ad §. 1. obs. 5. hujus sect. Sepulchr.

(*t*) Ibid.

(*u*) Obs. cit. & 2. & 4. §. 1; & 6. §. 1. & 11. & 11. §. 1. & in additam. obs. 49. & 64. & 76. & 86.

(*x*) De calculo receptac. chyli. hydr. causa.

the surgeon seven different times; as fresh fluids were always collected, till, sixteen hours after the last evacuation, the patient ceas'd to live. And although this dropfy, as you plainly see, had not its origin from any taint of the viscera, yet the "omentum was found to be almost universally consumed; and the other viscera were beset with a gangrene: nor is it to be wonder'd at," says Scherbius, "since, in process of time, the same is to be seen in all dropfical bodies."

But the love of truth does not suffer me to conceal what may, on the other hand, be said in favour of the paracentesis; as these last words, themselves, do not altogether run counter to its use, but even, if you rightly attend to them, recommend it. Not to enquire, therefore, whether that is always the effect of the water being discharg'd, and of the air getting in at the orifice, with what instrument soever, in whatever manner, or how many times soever, this operation may be perform'd; which the dissection of dropfical bodies frequently shows to be the effect of the disorder itself, as in these bodies the intestines are often found to be of a black colour, as they were in the patient here spoken of, though the waters had never been drawn off by paracentesis; certainly a great number of cures, that have been successfully perform'd in this method, will speak in its defence, and dissections will also argue for its use, as they have frequently made it evident, in patients who have died from other causes, that "the intestines were in a very good condition, and that in the abdomen, not to say in the peritonæum, where it had been perforated, "there was no trace of inflammation, and much less of "sphacelated corruption, to use the words of Polycarp Schacherus (y), who gives us the dissection of a virgin, that had been long troubled with an ascites, and had died "on the eighth day after the operation" of the paracentesis, which had been many times perform'd upon her.

32. But the instances of this method of cure being successful, are so rare among us, or, at least, were so rare, that during all the time I staid at Bologna, I never heard one physician say that he had seen it so; at which time, likewise, I saw there, and heard from every body, that the operations of this kind, which were perform'd by foreign surgeons, and these men of eminence, were unsuccessful. And indeed I remember that Albertini, on comparing the phthisis, and the dropfy, with each other, said that the former had been three times cur'd by him, though in a confirm'd state; but that the dropfy of the abdomen, when confirm'd, he had, to that very day, never cur'd.

For if the water, said he, is evacuated by the surgeon, I see that the patient dies: and if it be strongly urg'd, by the physician, to the renal, or intestinal passages, the medicines which force it to these passages, do not so much discharge that which is extravasated in the belly, as the serum which still remains in the blood; and do not force it more into those passages, than into the belly, where an entrance is already made for it. Thus he told me, it had lately happen'd to a man of eminence, in particular, who having taken remedies of this kind from an empiric, had his urine indeed increas'd thereby, but had the swelling of the abdomen so much increas'd at the same time, that scarcely any blood could be found in the blood-vessels after death.

(y) Diff. supra ad n. 8. cit.

Yet he did not conceal the surprizing cures of patients labouring under an ascites, whereof he had heard, or read; five of which were even reported to have happen'd at Bologna, from a puncture of the scrotum. But as he suppos'd that some had labour'd under an anasarca, rather than an ascites, others under an ascites, but one that was not yet confirm'd, and some under a dropfy of the peritonæum, he did not, in fact, leave many behind; and the cure of these was owing to nature rather, as he thought, than to art. And, indeed, the power of nature in curing this, and other disorders, is sometimes very considerable.

It happen'd in the place of my nativity, that a noble youth being seiz'd, once and again, with an ardent fever, and drinking a great quantity of water, both in his first and second illness, they were each of them succeeded by a very considerable ascites, which was carried off, both times, by a spontaneous discharge of a great quantity of water; spontaneous, I say, for this was commonly known, and the physician of the patient affirm'd it to me, who certainly would not have, unjustly, detracted from the honour of his own cures.

Without doubt, nature had sufficiently unlock'd, for herself, the passages by which she might reabsorb the fluid stagnating in the belly, and send it to another part of the body; and these were the same which she made use of, in that merchant spoken of by Mead (z), when she took up again into the vessels, and retain'd there, all the waters which were extravasated in the belly: and that in one night only, and in the very night which preceded the day, intended for drawing them off, by perforating the abdomen. But when the same nature, neither of herself, nor when excited by gentle invitations, or somewhat more acrid stimuli, attempts any thing for her own relief, must we attempt any thing violent, and dangerous, and contrary to her dispositions? Or must we rather make use of the paracentesis, where all circumstances permit it, which is a remedy, as we may suppose, first pointed out by the same nature herself?

33. For as to the navel being open'd by the great force, and distention, of the water, and the ascites being cur'd by the discharge thereof, I do not suppose this to have been first seen by Benivenius, and others whom Donatus (a), and Gabelchoverus (b), quote, but by men of antiquity formerly; and these persons, also, have remark'd that they, in whom the water was discharg'd altogether, died; but that some of those, in whom it came out gradually, and at different times, recover'd. Physicians, therefore, might, according to their general rule, imitate nature, when she operates rightly: and Hippocrates (c), and after him Celsus (d), advis'd not to let all the water be discharg'd at one time; for that this was fatal: the causes of which have been explain'd by many learned men, in our present age, and among these by the younger du Verney (e), by Werlhofius (f), and Mead (g); but more copiously by the illustrious Senac (h).

(z) Monit. med. c. 8. in fin.

(a) De med. hist. mirab. l. 4. c. 21.

(b) Sect. hac Sepulchr. in schol. ad §. 1. obs. 6.

(c) Sect. 6. aph. 27.

(d) De medic. l. 2. c. 8.

(e) Mem. de l'acad. r. des sc. a. 1703.

(f) Commenc. litter. a. 1735. hebdom. 37. n. 2.

(g) C. 8. supra ad n. 32. cit.

(h) Traité du coeur l. 4. ch. 12. n. 3.

The explications of these gentlemen seem also to be confirm'd by that observation (*i*), in which all the matter was drawn out without any swooning being the consequence; but so slowly, and gradually, by reason of its tenacity, that almost three hours were spent in the operation: and this will seem less surprizing to you, when you have learn'd from the celebrated Targioni (*k*), that there was a dropsical person, who had his belly fill'd with so dense a jelly, that it could not be drawn out by any art of the most experienc'd surgeon. But nothing has more confirm'd these explications, than the method which was happily thought of, in conformity thereto, of drawing off all the water at one time, without any injury; that is to say, by binding the abdomen with rollers, not only after the water was discharg'd, which du Verney (*l*), whom I just now quoted, order'd after a plentiful discharge, but also while it is still more and more drawn off, and then in particular.

By this method, he who first invented, and applied it, I mean that excellent physician Mead (*m*), mentions that many persons, but a woman, in particular, was cur'd under his care, who had all the water discharg'd "at "once," to the quantity of "sixty" pounds weight; and that another had her life preserv'd, for the space of six years and seven months, from whom, through the whole progress of her disease, water was taken away in such a quantity as, if the history were not well known to every body at London, would be incredible, that is "a thousand nine hundred and twenty pints." But with how much caution these operations are to be undertaken, and perform'd, those eminent surgeons among the English, that he mentions, have shewn: although he even knew a dropsical woman, who surviv'd after the abdomen had burst of itself, and discharg'd a great quantity of water; a similar case to which you will read the description of by Nebelius (*n*). In both of these instances the abdomen being over distended had crack'd near the navel.

Other observations are, moreover, extant of waters spontaneously bursting out at the navel itself, with a happy event; but scarcely ever of all bursting out together: and these, not only produc'd by those whom I mention'd above, but by others (*o*) also. Yet physicians have not gone on to open the navel, in order to cure the ascites, as some of them were influenc'd by contrary observations, and most of them taught by experience, that in proportion as the abdomen is more easily extenuated there, by the distention of the water, with so much the more difficulty does the wound heal up afterwards, which frequently happens; and that it is stop'd up with less convenience at present, in order to prevent more water being discharg'd, than the strength of the patient could bear; and, finally, that all of it could not possibly be drawn off, without the patient being oblig'd to lie on his belly, which is a posture very inconvenient in such cases.

For as to its being better to discharge the water by the navel, because, by these means, the umbilical vein being open'd, the watery humour would not be pour'd out from the liver thereby, into the belly, but would be

(*i*) *Commerc. litter.* a 1745. hebdom. 52. n. 3.

(*k*) *Prima raccolta di osserv. med.*

(*l*) *Mem. cit.*

(*m*) *C. 8. cit.*

(*n*) *Eph. n. c. dec. 3. a. 9. & 10. obs. 122.*

(*o*) *Act. n. c. tom. 8. obs. 79.*

thrown out of the body; this was an opinion which, having taken its rise lately from hypotheses, and from the opinion of some persons that Avicenna makes mention of (*p*), has seem'd, at last, to be confirm'd by some observations. For there have been, as you see here in the Sepulchretum (*q*), those who have said that this vein, which had been already long contracted into a ligament, being soften'd by the continual maceration of the waters, was again open'd, and that it then discharg'd the superfluous water from the liver, by the navel; and that they had found it so dilated, at this time, as to admit a catheter, and a goose-quil: and that it was very full of water, and contain'd a considerable quantity.

I, however, although I should be willing to grant, that it may be kept open in some, as it is from the original formation, rather than suppose it could be easily open'd again, after being condens'd into a ligament; and though I cannot agree with Schultzius (*r*), who has asserted that after the birth it is drawn up to the liver, from the navel, so as not to go thither any more; yet it would not then, by any means, appear, how it should take up serum only, from the sinus of the vena portarum, and leave the blood behind. And this I do not say, so much on account of Platerus, and Hildanus, as on account of Rolsinc, who is more modern than either of them.

Yet I do not deny their observations; and only suspect that they did not find the umbilical vein, but merely the theca, to be open and full of water; with which theca, from the duplicature of the peritonæum, this vein is increas'd in its bulk. For in dropfical bodies the membranes are easily relax'd: and the vacuity betwixt them is fill'd with the redundant water. And this suspicion of mine is strengthen'd by an observation, which is not Riolan's, as Rolsinc thought, but is nevertheless extant in his works (*s*). The umbilical vein, says he, "was found to be fistular in a certain dropfical woman, and through that, water was pour'd out betwixt the peritonæum, and the abdominal muscles."

But now let us subjoin the case of a very long dropsy, as I have promis'd (*t*).

34. A virgin of twenty years of age, having had no appearance of the menstrual discharges, for two years before, was first attack'd with pains in the hypochondria; after which her belly began to be tumid. She had been afflicted with this tumour for about a year, and had us'd various remedies to no purpose, when she was receiv'd into this hospital of Padua. The bulk of the swelling was extremely large: yet this patient could lie down in bed for the whole month she was there, even to the last; but she lay, for the most part, on her left side. She was thirsty, but not to a great degree; unless when a slight fever, with which she was constantly troubled, increas'd. She discharg'd but a small quantity of urine: yet it was not very high-colour'd. She now and then complain'd of those pains in the hypochondria, that I have already spoken of, which seem'd to be convulsive, but not very violent. Many remedies were made use of, but without the least advantage: the quantity of her urine was never increas'd. Among these remedies were

(*p*) Traët. supra ad n. 30. cit. c. 5.

(*q*) Obf. 13. cum schol. & obf. 14.

(*r*) Diss. de vasis umbilic. nator. & adultor.

(*s*) Anthropogr. l. 2. c. 12.

(*t*) N. 29. in fin.

some things which created an uneasiness, as gum ammoniacum, and turpentine : for which reason they were omitted.

At length, when the belly, from being costive, was become pretty lax, foetid, and liquid, stools began to be discharg'd, but not purulent. As the discharge of this matter continu'd, the belly did not decrease, and her strength was every day broken more and more, that happen'd which is foretold of a dropical person, in the latter end of the fourth book *de morbis* : " but where the intestines are also very lax he dies very soon, with the " power of his senses and his speech quite perfect." Her senses, therefore, continuing to the last, she died about the middle of December, in the year 1744. Having this relation made to me on the following day, and having made it known to a very crowded audience, and foretelling some of the appearances which were soon after found under their eyes, the dissection was immediately begun in their presence.

The body was emaciated, particularly in its upper limbs, but not to a great degree. The inferior limbs were affected with so slight an œdematous tumour, that you could scarcely distinguish it, but by pressing them with your finger : and this did not reach quite to the top of the thighs. The belly was very large, but not tense ; nor yet the navel, although it was prominent.

The abdomen being perforated at one side, a great quantity of water was gradually discharg'd, which left the same sensation upon the hands, as a lixivium pour'd upon them would have done. That which first flow'd out was yellowish, and thin ; the other less thin, and almost white. But when I examin'd both of them, after being left, for twenty-four hours, in a very large vessel, the whole of it seem'd to be whitish ; yet when it was pour'd out, by degrees, from one vessel to another, it appear'd to be rather yellowish : nor had much whitish humour, subsided to the bottom, in proportion to the quantity of water. What had subsided, however, was pretty thick, from little pieces of the omentum being mix'd with it, and other things of which I shall speak hereafter.

However, neither the water, nor the body, had a putrid smell, notwithstanding the small intestines had begun to grow black in three places, though not beyond the breadth of an inch in each place. The greater part of those intestines were tumid with air, but in not great quantity. The large intestines, as well as the stomach, were altogether empty, and collaps'd. The whole of the omentum (if you except a small part of it which remain'd, and adher'd to the stomach) was torn into pieces, as it were ; and not only entirely separated from the remaining part of its substance, but from each other also : one of which had form'd itself into a round, red, and soft body, nearly of the length of a man's forearm.

The liver, on its whole convex surface, and even at its anterior border, coher'd with the diaphragm : and when divided from thence, seem'd to have that surface more protuberating, than was agreeable to the liver itself, and to the stature of the virgin, which was rather inclin'd to smallness. When cut into, I found it every where, except in the lobulus Spigelii, somewhat more pallid, and harder, than was natural : and the bile, which was in its vesicle,

vesicle, in small quantity, of a yellow colour inclin'd to brownish, turbid and viscid.

The spleen, except that its size was preternaturally increas'd, was internally found: as a second spleen also was, which was less by many degrees than the former (its diameter being only an inch in extent) of a roundish figure, and adher'd among the vessels, being connected to the larger spleen, by membranes, and in the neighbourhood of it, but entirely disjoint'd in its substance, though exactly of the same structure internally, and of the same colour. But in the coat of the larger spleen, beside some hydatids, little bodies of a roundish figure, white, hard, and of different sizes, were prominent: yet most of them were somewhat bigger than millet seeds.

The same appearances were observ'd, here and there, on the interior surface of the peritonæum, and on the exterior of the intestines, especially of the small ones, in which, likewise, were hydatids. The largest of these was equal to the size of a small apple, and of two inches in diameter; the sanguiferous vessels from the intestine, producing themselves through the membrane thereof, and dividing into branches. In it was contain'd water almost colourless, but in part mucous. The pancreas was hardish. And the mesenteric glands, which were so increas'd beyond their natural size, as almost to fill the whole mesentery, were perfectly scirrhus; as their hardness and whiteness demonstrated.

Yet I met with the chief and peculiar disorder in the testes, the tubes, and the uterus itself: which was not discover'd in the uterus, without dissection; but in the testes, and the tubes, came spontaneously into view. For these parts had, equally on both sides, together with the *alæ vespertilionum*, so coalesc'd one with another, and, being much thicken'd, had so grown into a kind of tuberous, and shapeless mass, of a considerable size, that one could not, by any means, be known from the other, and much less separated. The surface of each of these masses was lacerated, for a considerable space, and was found to be spontaneously open, just as if a large steatoma had burst itself. And to this I compar'd it, because it consisted of a matter, which resembled nothing more than half-dried suet: so white was it; of so unctuous a nature if you handled it; and so easily yielding to the probe when push'd into it. If you pull'd it asunder, you perceiv'd that it consisted of so many small pieces, as it were. And it was quite inodorous.

As the parts, which I have mention'd, seem'd to be converted into a kind of suet, so when I cut pretty deeply into the fundus of the uterus, which was found externally, and in the greater part of its parietes, I saw that the remaining internal part of the substance, of these parietes, was converted into a matter which was similar to that just now describ'd; except that, in its colour, it inclin'd somewhat to the cineritious hue. And with the same matter the cavity of the fundus was fill'd; and from that the part which was least solid, seem'd to have been accusom'd to fall through the cervix, into the vagina, which was even now whitish, from the remains of this very matter, that could easily be wip'd off. However, the cervix, both internally, and externally, was perfectly sound: and the magnitude of it, and of the fundus, also, was not greater than was to be expected, in a virgin of such an age; except that the internal orifice of the uterus seem'd to be somewhat larger than usual.

The other parts of the belly, and the kidneys in particular, were found. Yet the trunk of the great artery appear'd to be of a less latitude than it ought to be. And the diaphragm ascended pretty high into the thorax, but much the most on the right side; whither it was forc'd, as I have said, by the protuberance of the liver. When we took this viscus away from the diaphragm, by cutting through the vena cava, some considerable quantity of blood flow'd from it, of a black colour, and not coagulated.

The lungs were every where, very closely, connected to all the parietes of the thorax, that is to the inferior parietes also. The upper part of the left lobe was, in one place, somewhat harder than is natural, yet not evidently diseas'd. In the pericardium was a great quantity of water, of the same kind with that in the belly. The heart was lax; and in this, and the great vessels, was only little blood, which was black indeed, but less fluid than that in the inferior vena cava, although without any polypous concretion.

While the head was cut off from the neck, a little water flow'd down, both from the cavity of the vertebræ, and of the cranium. And the lateral ventricles of the brain contain'd water in no very small quantity, of a brownish colour and turbid: the plexus choroides were in great measure pallid. Yet the cerebrum was pretty firm, notwithstanding the cerebellum was very soft.

35. There are many things in the observation in question, which, if I were to consider them separately, would make this letter far more prolix than the preceding. You will perceive this from what I shall say of hydatids only. For although that rare disorder of the uterus very well deserves to be treated of, yet I shall have a more convenient opportunity of speaking of it, in other letters, and perhaps in the next (*u*); for, certainly, this was not the proximate cause of the dropy of which we are to treat at present, as the ruptur'd hydatids seem to me to have been. For, as on the external surface of the intestines, and the spleen, some hydatids were prominent, which had not yet burst asunder; so I suppose that there had been almost innumerable others, both in these, and in other parts, which having been ruptur'd long before, had pour'd out their fluid into the cavity of the belly. And, not to detain you with many words, the observations which I have very frequently made upon the tunica albuginea, and vaginalis of the testicles (*x*), induce me to believe that the membranous laminæ of the hydatids, or of the coats in which they are form'd, after they have by rupture pour'd out the fluid that they contain'd, first contract themselves, and their vessels, into the form of a caruncle; and unless a fresh fluid continue to flow thither, are finally so indurated, and dried up, as to represent those white and hard tubercles of a roundish figure, some larger in their size, and some less, as the hydatids had been, with which the internal surface of the peritonæum, in the virgin describ'd, and the production of it through the external surface of the spleen, and intestines, were beset.

You may read, in the Sepulchretum (*y*), an observation of Jacobus Wolfius, where he says, that in the body of a woman, who had labour'd under

(*u*) Epist. 39. n. 36.

(*x*) Vid. epist. 43. n. 16. & seq.

(*y*) In. additam. ad hanc section. 21. obs. 65.

an ascites, “caruncles, which, when open’d, discharg’d an ichor, adher’d, “in several places, to the intestines.” Read what is produc’d from Bilgerus (z), of another woman, who had an ascites, “that the whole of the “intestines, on all sides, and the peritonæum, on both sides, about the “diaphragm, were fill’d with many thousand little granules, in the same manner that sometimes happens to hogs. Join to these the observations afterwards publish’d, which were taken from other dropsical bodies; as, for instance, that of the celebrated Anhornius (a), who saw the peritonæum, in a young man, “beset with glandular knots, which wept a limpid water, if “press’d,” and, in a woman, having, “here and there, many glandular “tubercles, protuberant in the shape of a bean, some larger, and some “smaller, in their size, which, when press’d, wept a limpid water;” and, in like manner, those of the celebrated Stegmannus (b), and Goetzius (c), the first of whom observ’d the pancreas, in a man, to be sprinkled with millet-feed, “as it were,” and the latter, in a virgin, various tubercles of different “magnitudes, growing here and there” (to a sac in which a fluid had been contain’d) “varying from the size of a large pea to that of the smallest “hemp-feed, sometimes solitary, sometimes in clusters, but always scirrhus, “and hard, and, when cut asunder, discharging no fluid, or gelatinous “matter.”

Finally, read over again what I have formerly written to you (d), of hard granules, or tubercles, being prominent on the internal surface of the peritonæum, or pleura; as water was even then extravasated in the great cavities, which those membranes surround: you will certainly find the series of successive changes that I have describ’d. It happen’d, some years ago, that in a woman, who had been taken off by an ascites, the external coat of the intestines was found to be distinguish’d with very frequent tubercles. Part of the small intestines was brought me, that I might judge what these tubercles were. When I first examin’d them they resembled small turgid lenticular glands: but they were without an orifice, and solid, and seem’d to be made up neither of glandular, nor of a fleshy substance, but to be of a middle nature, as it were, betwixt both. I judg’d that I could determine upon nothing more probable, in regard to them, than to suppose that they were the remains of ruptur’d hydatids, contracted into themselves, but not to so great a degree, at present, as to be dry and hard.

Nor was I deter’d by so very great a number of hydatids, as there must necessarily have been to agree with this supposition; since I very well remember’d the almost innumerable quantity, which Coiterus (e) formerly found in a professor at Bologna. His words are, “to the mesentery, peritonæum, intestines, spleen, liver, and, finally, to all the viscera, vesicles “of an unequal magnitude, and these full of limpid water, adher’d.” And not to lead you too far from the observations of other ancient authors, and even not to lead you from the Sepulchretum, wherein that of Coiterus is not entirely omitted (f), consider that Philippus Persius (g) found, in a woman,

(z) Sect. ead. obs. 20. §. 16.

(a) Eph. n. c. cent. 9. obs. 100. n. 2. & 7.

(b) Earund. dec. 3. a. 5 & 6. obs. 168.

(c) Act. n. c. tom. 2. obs. 208.

(d) Epist. 16. n. 30. & epist. 22. n. 18.

(e) Obs. anat.

(f) Sect. hac 21. obs. 21. §. 8.

(g) Ibid. §. 6.

who like our virgin had fallen into a dropsy from a suppression of the menses, “ the kidneys, uterus, stomach, intestines, heart, pericardium, liver, “ and spleen, abounding (for the number of them exceeded nine hundred)” with pendulous vesicles of this kind: and, in like manner, that Mauritius Cordæus (*b*) found in another woman, all the parts internally, and others, “ cover’d, and loaded, on their external surfaces, with these pendulous cysts,” of different sizes, and forms, “ being fill’d with a citron-colour’d fluid, and, at least, exceeding the number of eight-hundred; not to speak of a third, as the fluid was not yet extravasated into the belly, who being suppos’d to be pregnant, had “ the whole body internally, the epiploon, mesentery, liver, spleen, lungs, the heart itself also, and the peritonæum, beset with vesicles, full of the most limpid water,” from the observation of Ballonius (*i*).

36. You see, therefore, that the parts which, in the virgin whose history I have given, were rough with tubercles, have been, in other dropscal bodies, beset very thickly with hydatids; as the intestines, the spleen, and the peritonæum. And indeed the last-mention’d part is sometimes cover’d with so great a number, that it “ scarcely comes into view,” as Ruysch (*k*) found it, and represented in a figure; or is resolv’d into filaments, and vesicles full of water, as Paawius (*l*) found it to be resolv’d, in the cavity of the belly, together with the omentum, both of them being wanting, in their natural situations.

But the omentum, although it is a production of the peritonæum, just in the same manner as the external coat of the spleen, and the intestines, and hydatids are frequently form’d therein also, and that not uncommonly, as many observations show, among these that of Boschius (*m*), Malpighi (*n*), Valsalva (*o*), Goekelius (*p*), yet it is of so tender a structure, that it cannot often confine them, for a long time, within its laminæ: wherefore they generally sooner burst asunder on their increase, and, at the same time, tear asunder, and destroy it: and this I consider as one of the principal causes, why, in patients who have an ascites, the omentum, for the most part, as happen’d to the virgin in question, by no means remains found. And from hence Hippocrates, I suppose, took occasion to say (*q*), “ that they, whose “ liver, being full of water, has discharg’d itself upon the omentum, have “ their belly fill’d with water.”

For he who, in brute animals, saw hydatids, of the lungs, as I have taken notice of to you on a former occasion (*r*), observ’d those appearances, also, in them which I just now spoke of, that is to say, sometimes, hydatids of the omentum, but more frequently that *erosion* which Galen requir’d (*s*); and brought the water down from the neighbouring liver, into the omentum, as from the viscus, “ most apt,” as Galen says, “ to generate hydatids, in the “ membrane that surrounds it externally;” inasmuch as “ the liver seems, “ sometimes, even in animals that are kill’d without disease, to be full of

(*b*) Ibid. §. 14.

(*i*) Sepulchr. l. 3. f. 37. obs. 3. §. 12.

(*k*) Thef. 7. n. 37. & tab. 2. f. 3.

(*l*) Sepulchr. f. hac. 21. obs. 3. §. 8.

(*m*) Ibid. obs. 21. §. 2.

(*n*) Exerc. de omento.

(*o*) Supra n. 4.

(*p*) Eph. n. c. cent. 6. obs. 94.

(*q*) S. 7. aph. 55.

(*r*) Epist. 16. n. 33.

(*s*) Comment. in aphor. cit.

“them.” And physicians, since it has been customary to dissect human bodies, have not only confirm’d the observations of the ancient preceptors in medicine, taken from beasts, by the inspection of human bodies; but have also retain’d their hypotheses of the cause of the dropfy, often to be deduc’d from water being pour’d out of ruptur’d vesiculæ, in whatever viscus these may be suppos’d to exist: although even afterwards, they have, every now and then, return’d to brute animals, if they might happen to see some things which relate to the examination of hydatids more clearly: and that this has not even been neglected by me, as far as was in my power, you will perceive from what I shall subjoin.

37. Among the number of the largest hydatids, that certainly was one, which Caldesi (*t*) saw in the liver of an ox: for the whole weigh’d nine pounds; and the coats, by themselves, sixteen ounces. And as these coats were three in number, each of them, in general, consisted of many other laminæ, were robust, and fleshy; but the external coat, in particular, more than the others, firm, muscular, and consisting of fibres very much entangl’d with each other: whereas the internal was very weak and thin: and the middle coat, which was of a golden colour, and rugous, had some pieces of gypseous, or rather of bony matter, affix’d to it. The water which was comprehended within these coats, being of a limpid appearance, and saltish in its taste, was not in the least chang’d, by the mixture of different liquors with it: nor yet did it coagulate by boiling, any more than the liquor of other hydatids, on which he had made this experiment in vain.

If with this structure which I have describ’d, you compare that which Cordæus (*u*) observ’d, in so many bladders seen by him, (for Persius (*x*) has nothing in regard to the structure, nor yet Ballonius (*y*), except that he remark’d “a triple coat” on each of them) you will easily perceive, of how much advantage to Caldesi, the magnitude of his hydatid was. For Cordæus only saw the following things, “that they were made up of two membranes, “the internal very white in its colour, the other very simlar to the coat of “the stomach, yet somewhat thinner, but perfectly of the same colour “therewith.” To me however, although it cannot be doubted, but that some of the appearances which Caldesi saw, were peculiar to that hydatid; it has never yet happen’d to light on any so large as I would have wish’d: and when I have lit on any, I have not been able to examine them, otherwise than externally. Yet, even in this manner, have I remark’d some things, which, perhaps, are not unworthy of our diligent inquiry, in others of the same nature.

I formerly saw one in a calf of fifteen days old, which was round in its figure, of six or seven inches in diameter, hanging from the flat, and upper, part of the liver, into which, in some measure, it subsided; being closely fix’d thereto, to the extent of two or three inches: and from this part to which it was fix’d, did it receive its blood-vessels, but most of them in such a manner, that, as I retain it firmly in my memory, I shall relate it to you. For as I could see, through the membrane of that hydatid (which, in other respects, as I perceiv’d by taking hold of it, betwixt my fingers, was not

(*t*) Osservaz. int. alle Tartarughe.

(*u*)

5

(*x*)

(*y*) Supra ad n. 35.

very thin) not only the water that it contain'd, which was of a greenish colour, slightly inclining to yellow, but even (as this water was pellucid) whatever swam therein; so some small trunks of vessels seem'd to be carried from the liver, through the middle of the cavity of the vesicle, which, after having reach'd to the opposite part thereof, were reflected upon the external surface of it, and being divided into larger, and smaller ramifications, made a kind of beautiful net-work.

But, although I saw this net-work, and those ramifications of blood-vessels very plainly, and undoubtedly, and very slender striæ of fat, as it were, attending upon them; yet as I saw those included, and floating trunks, which striæ of the same kind seem'd to accompany, only through the substance of the transparent membrane, I beg'd of those who show'd me this hydatid, that they would suffer me to open it; but in vain, as they said they were willing to show it to some other persons, to whom they had just before promis'd the inspection. And from them, (who either did not properly attend to the included trunks, or did not well observe what would follow from that passage thereof through the cavity of the vesicle) I could get no other information, than that the water was of a saltish taste, and did not at all coagulate on the fire.

Not long after this in the calf, I saw another hydatid, less indeed than that, for it was not bigger than a hen's egg, yet considering the proportion of the animal wherein I found it, much larger. This animal was an old hen-pigeon, which even at this time lay'd eggs, and, though seemingly very healthy, was found suddenly dead in her nest. As no cause of this unexpected death appear'd externally, upon examining internally, I found the brain, the lungs, and the heart, to be found, and without any mark of disease; except that the ventricles of the brain were entirely empty, and the heart itself without blood; when, at length, going on to the liver, I perceiv'd the cause of this last appearance, and of the sudden death.

For the liver was somewhat livid in general, and, on the upper part, almost black, and softer than natural; and a large blood-vessel having been ruptur'd there, a great quantity of blood had been extravasated about this viscus itself, and the intestines, and had coagulated. I suppos'd the rupture of this vessel to have been accelerated by the pressure of the large hydatid, of which I have already begun to speak. This hydatid had one of its extremities fix'd into the internal substance of the ovarium; as other lesser hydatids had also, of which I shall speak presently: and through its surface sanguiferous vessels were scatter'd; a yellowish water being contain'd within, not comprehended in one cavity, as far as I could judge externally, but divided into many cells, which were transparent. To the membrane itself, of which the hydatid was compos'd, at the extremity that I have spoken of, some very small *vitelli* were inherent, very similar to the others, with which the ovarium abounded: yet they were somewhat harder than these, and inclin'd more to whiteness.

From the ovarium, beside one pretty large egg, which was almost ready to fall off, some other hydatids were pendulous, perfectly similar to the one I have already describ'd, except that they were about three times less, and not connected immediately to the ovarium, but by means of an intervening peduncle,

peduncle, or stalk, of a considerable length. Finally, there were some others, not larger than a very small bean, situated among these vitelli; but these much more white than the others, and full of a limpid water. Yet by boiling, neither this water, nor the yellowish water of the others, coagulated: and the eggs, which adher'd to the extremity of that largest hydatid, as they had been less soft before boiling, were, also, more harden'd than the others, afterwards. I intended to have examin'd internally, the cells which I had seen through the coats of the larger hydatids, but being call'd away on some occasion, a servant unseasonably diligent, who suppos'd that I had examin'd every appearance to my satisfaction, threw them all away, in the mean while, to a place, from whence, though I was greatly chagrin'd at the accident, it was impossible for me to recover them.

38. Do not be surpriz'd that I was so much displeas'd, at not having it in my power to examine closely, into those appearances I had seen, in the calf, and the pigeon, through the coats of the hydatids. For the hydatids which show sanguiferous vessels passing through the middle of their cavity, or this cavity divided into several cells, you cannot easily account for, as to their origin; either from a simple glandular vesicle, the orifice of which has been stop'd up, or from some one interstice of a lymphatic vessel, that lies betwixt two pair of valves, being shut up on both sides.

From the time that Wharton made use of those interstices of the lymphæducts, to explain the formation of hydatids, in that manner which has been transfer'd, not once only, but twice, into this section of the Sepulchretum (2), he has, probably, had not fewer followers, than they who have made use of the simple gland: and there have even been some, who, by making additions to the hypothesis, have endeavour'd to render it more probable. The industry of all which authors I commend: and I even believe, that the great number of vesicles which Persius (a) had seen "doubled, as they are taken out in trouts," argue for the opinion of Wharton; since they resembled two interstices not yet disjoin'd, as those "pellucid little cords, consisting of thin vesicles, chain'd together, as it were," many of which have been sometimes seen in the waters of patients in an ascites, by Mead (b), also do.

But, although I do not deny, that hydatids may have their origin, in some certain way or other, at one time, from a simple gland, and, at another time, from interstices of this kind; yet I do not see how they can all be accounted for from thence. For it is long ago that Ruysch (c) admonish'd us, of a great number of hydatids being found in the placenta uteri sometimes, as I have also seen, and in other parts, in like manner, wherein no lymphæducts are found. He therefore suppos'd "that hydatids were the extremities of sanguiferous vessels, which had chang'd their former nature, and had degenerated into a diseas'd structure." There are some, also, who imagine, that if a watery humour flow, not only from the injur'd parietes of the lymphæducts, but from any part whatever, among the surrounding membranes, they are consequently elevated, and form'd into hydatids. And if any one should choose to illustrate their opinion with a little accuracy, he might, perhaps,

(2) Schol. ad §. 8. obs. 10. & ad §. 2. obs.

21.

(a) Ibid. §. 6.

(b) Monit. med. c. 8.

(c) Advers. dec. 1. c. 2. vid. & thes. 6. tab. 5. fig. 3. & seq.

render it proper to explain, and account for, the greater part of hydatids; and would understand, without difficulty, from the cellular structure which lies betwixt the membranes, and the sanguiferous vessels, which pass through that structure, from whence it is, that some hydatids (*d*) appear to be divided into cells, and why (*e*) vessels are carried through the middle of the cavity of others: to which vessels if he should refer those "two slender fibres" that Tysonius (*f*) observ'd in so many hydatids, "proceeding" from one extremity thereof, "and fluctuating within their liquor," he would probably come much nearer to the truth, than this author, when he conjectur'd hydatids of that kind to be insects; which sucking out a nourishment for themselves, transmitted it into their belly, by those two little tubes as it were.

And if hydatids, that are pendulous by a long and slender stalk, should chance to require an explication, I mean such hydatids as Ruysch (*g*) (who has given a figure of them (*b*)) and others, and I myself, have often seen, particularly from the ovaria, and the neighbouring parts, of women; and not only those that were pendulous from the ovarium of that pigeon; the same person will be at liberty to suspect that the other cells of any hydatid, being broken off from the small sanguiferous trunk, or being collaps'd, in consequence of having pour'd out the humour they contain'd, one of the extreme cells still remains connected, and still retains its fluid. And, indeed, I have, sometimes, very evidently seen a small sanguiferous vessel, passing along with the filament, by which an hydatid of this kind was pendulous (*i*).

39. But there are still others to be attended to: and these of greater importance likewise, not only on account of the disease in the viscera, wherein they are generated; but on account of the more easy production of that disease, which I am at present speaking of. Hitherto I have, in general, spoken of those that are prominent on the surface of the viscera, or pendulous therefrom. Yet there are others which lie latent underneath, or are, at least, not very prominent, for the most part; as in the kidneys in particular. I describ'd them formerly in the *Adversaria* (*k*), under the title of large cells; and have often told you, in the course of these letters (*l*), that they have been seen both by Valsalva and me.

But I have seen this appearance at other times: and not only one of them in a sow, which was almost as large as a nut, but also in human bodies, and these pretty large. Yet none of these, if you except one which I have refer'd to in a certain ossler or stable-keeper (*m*), was rais'd up beyond the surface of the kidney; not even that which was seen by Valsalva, in the body of an old man (*n*), and which occupied one half of the kidney. And yet I have seen others that were prominent, particularly in two old women; the history of one of whom I will here relate to you, on this account merely, but in a very brief manner.

(*d*)

(*e*) N. 37.

(*f*) In additam. ad hanc Sepulchr. sect. ap-
pend. ad obs. 49.

(*g*) C. 2. cit.

(*b*) Obs. anat. chir. fig. 63.

(*i*) Vid. epist. 43. n. 19.

(*k*) III. animad. 33.

(*l*) Epist. 4. n. 19. ep. 10. n. 19. ep. 17. n.
14. ep. 21. n. 15. ep. 24. n. 6. & ep. 25. n. 4.

(*m*) Epist. 4. n. cit.

(*n*) Epist. 17. n. cit.

40. An old woman who had an incurvation of the spine, and was lame, died in the hospital at Padua, after the middle of March, in the year 1747. She had been lately brought thither, on account of a disorder of the apoplectic kind, which did not appear to have injur'd any other faculty, but that of her speech. Wherefore, as the other disorders of the woman could not be properly known, and as I was then taken up in other observations, relative to parts which were in their natural state; and even continu'd my inquiries in reference thereto, in the body of this woman, I had but just opportunity to remark the following preternatural appearances.

In the belly, the trunk of the great artery began, almost immediately, after giving off the emulgents, to dilate itself gradually more and more, the more it descended; till, a little above the division, it expanded itself wholly into an aneurism, which was of two inches diameter, in every direction. From thence it was again gradually contracted; yet in such a manner that the iliacs themselves appear'd to be much wider than they naturally are, to a considerable extent. The internal surface of these vessels was unequal: but the internal surface of the aneurism still more so; where not only polypous concretions were found, but in one part of the coats, bony concretions also. I should be inclin'd to suppose, that the cause of these disorders of the aorta, had, in great measure, consisted in the distorted figure of the spine; which, having a convexity in the thorax, on the right side, had another on the left side, in the loins, which carried away the aorta along with it. And for this reason I was less surpriz'd to find, in the left kidney, those disorders on account of which I describe to you this dissection.

For from the lower extremity of that kidney, an hydatid, of the bigness of a small apple, protuberated. It was full of a redish water, although, when look'd at through the surrounding coats, it seem'd to be blackish. These coats were two in number externally; the outermost of which was nothing else but the adipose membrane of the kidney, deprived of its fat, by the very emaciated state of the parts: the other was the proper membrane of the kidney, which, not only the quantity, but also the weight of the included water, in consequence of pressing from above downwards, in that situation, had distended. Wherefore, although there were two other less hydatids, in other parts of the same kidney, they had not rais'd up that membrane beyond the surface of the kidney; that is to say, they were confin'd under it, like the other more frequent cells, and had hollow'd out a kind of bed for themselves, in the substance of the kidney. And a larger hydatid had, also, hollow'd out a seat for itself, in the upper part of the substance of this viscus, almost in the shape of a hemisphere; so that you might perceive it to be of the same kind with the others: the diameter of this hemisphere was equal to the breadth of a man's thumb.

41. The dissection of another old woman you will have on another occasion (o), in whom the left kidney, in like manner, but at its upper extremity, was greatly extended into an hydatid which had form'd itself thereon; as this hydatid contain'd water, of a slight yellow colour, to the quantity of four ounces.

To the larger vesicles of this kind you will, without doubt, refer that "large watry abscess," as Harvey (*p*) call'd it, "like a hen's egg, and fill'd with yellow water, which had impress'd an orbicular cavity" on one of the kidneys; as there were also other lesser appearances, of this kind, on the anterior surface of both the kidneys, of a very old man, who had died with a suppression of urine. Or, at least, you will refer to this class, "a bladder like a large walnut, distended with the most limpid water, and inherent to half its diameter, in the substance of the kidney," which Doringius (*q*) found in Bucretius; whose same kidney contain'd a great quantity of sand, at the same time that the other contain'd a calculus.

Two vesicles equal to that, and fill'd with a kind of watry humour, resembling urine in colour, I remember to have found, formerly, in the body of a man which I dissected at Bologna, in the anatomical theatre, as a substitute for Valsalva, in his absence: and the pelvis of the same kidney, in which were these vesicles, and three whitish calculi, of the bigness of vetches, was dilated. I also remember that the man died with a suppression of urine, in his bladder indeed: but this was not the cause of his death; as there were other more considerable diseases, which it is not necessary to take notice of here (*r*). These two hydatids, however, were confin'd, as most of them are, under the proper membrane of the kidney. Nor do they seem to have appear'd differently, which Willis (*s*) asserts "had been frequently found by him, in hydropical bodies," where he tells us, that in the body of an illustrious man, there was "a large cavity in the middle of the right kidney, distinct from the pelvis, much larger than that, and fill'd with limpid water," and that the left kidney "contain'd many hydatids, and cavities fill'd with a very limpid water."

He conjectures that very small cavities had been first form'd in the substance of the kidneys, by serum stagnating in some part of it; which cavities were more and more dilated, by the gradual increase of this fluid: and doubtless you see that "limpid, very limpid, redish" water was found in those cavities. Nor indeed have I been without doubts, at several times (*t*), although from the colour, and the odour, it more frequently seem'd to be urine, whether it was not, rather, "a fluid very similar to urine;" as I was not ignorant, that the serum of the blood is either very often, naturally, of a yellowish colour, or becomes so, by its remora in the viscera: and that the humour, found in hydatids, is generally so, from what cause soever it may arise (*u*); and as I observ'd, at the same time, that it was possible it might contract its urinous odour from the kidneys, wherein it is so long retain'd: and that cavities of this kind were every where surrounded by an internal and uniform coat; so that it was never in my power, or the power of any other person, that I know of, to find a manifest communication with the pelvis, or tubuli, of the kidney.

Therefore, as to the case being quite different in the observation of Plateurus (*x*), where, on cutting asunder bladders full of water, which had form'd

(*p*) Sepulchr. l. 2. f. 1. obs. 17.

(*q*) Ibid. l. 3. f. 14. obs. 48.

(*r*) Vid. epist. 41. n. 10.

(*s*) Sepulchr. l. 1. f. 13. obs. 1.

(*t*) Vid. animad. supra ad n. 39. indicat.

(*u*) Vid. supra n. 35. 37.

(*x*) Sepulchr. f. hac 21. obs. 8. §. 2.

themselves upon the body of the kidney, “the water flow’d out, and the “foramina remain’d open;” so that this is not to be attributed to those bladders, but to the many ulcers, which, as he says, had perforated the kidneys, from the internal quite to the external parts; so nothing forbids us to suppose, that some of the ulcers had open’d foramina for themselves, quite to the cavity of the vesicles. And by this observation, we may be led to suppose another manner, in which those hydatids of the kidneys may much sooner, and much more certainly, bring on an ascites, where there are ulcers communicating with the pelvis; for these will reach sooner to the large cavities of those hydatids, than to the surface of the kidneys: and by carrying thither an acrid ichor, and a great quantity of urine, will burst them, and pour out this fluid into the cavity of the belly; just as they must, of themselves, have pour’d out their contain’d liquor, in another observation of Platerus (y), and had pour’d it out in that which I have refer’d to above (z), from Piccolhomius, in conjunction with the former of Platerus.

However, even when there are no ulcers, if these hydatids are so many in number, or so large in their size, as to have destroy’d, or condens’d, a great part of the substance of both kidneys; there is not the least doubt but a dropsy may easily happen, by the secretion of urine being greatly diminish’d. But if they, moreover, burst asunder; discharge their contents; and go on still to generate a fresh fluid; it is evident that an ascites must happen from thence.

42. Yet if they do not continue to secrete a fluid, but coalesce, in consequence of a new substance of the kidney growing up around them, when emptied, a dropsy does not arise; the little quantity of fluid, which they had discharg’d, being taken up by the mouths of the absorbent vessels, in the same manner that the fluid, with which the interior surfaces of the belly are moisten’d, is absorb’d: yet in the kidney a cicatrix remains, various in its magnitude, and its depth, in proportion as the ruptur’d hydatid had hollow’d out more or less of the substance of the kidney. Read over again the twenty-ninth letter (a), in that part where I describ’d, in the kidney of a woman, a long, whitish, and almost tendinous line; drawn, not only on the surface, but also deeply within the very body of the kidney; so similar to the cicatrix of an old wound, that I look’d for the traces of it in the neighbouring paries of the belly, but in vain. And I shall describe to you, in other letters, other cicatrices of the kidneys, less deep, but depress’d; and these comprehended in the circumference of a circle: of which kind that was, which follow’d the coalition of the larger hydatid, taken notice of in the old woman, whose history I gave you just now (b).

From hence you perceive, by what method we may explain, from the observation of hydatids, the cicatrices which are pretty frequently met with, on the surface of the kidneys. And suppose that the cicatrices of other viscera may, also, be explain’d in the same manner, when they are external, and neither wounds, nor signs of ulcers, have preceded; as that was, which is taken notice of in this very letter (c), as being found in the side of the uterus, of

(y) Ibid. obs. 11. §. 4.

(z) N. 19.

(42) N. 12.

(b) N. 40. in fin.

(c) N. 28.

an old woman, who had labour'd under an ascites. For the uterus has also its hydatids, sometimes, in such a number as is sufficiently shown by the observations of Adolphus Occo (*d*), and the celebrated Adam Christian Thebesius (*e*); and so large in their size, that, as I have hinted to you on a former occasion (*f*), Coiterus (*g*) saw one "hanging from the side of the collum uteri, "bigger, to appearance, than the natural bladder, and very full of urine;" or, as he says, with more justice, below, "full of thin, and transparent water, "and furnish'd, like the natural bladder, with two coats, but without any "meatus whereby to collect, or discharge, its contents."

But even cicatrices of this kind, both of the liver, and spleen, as, for instance, that which Hæchstetterus (*h*) has describ'd, in a noble virgin (for we must take care we are not deceiv'd by certain fissures, which often exist from the original formation) such cicatrices, I say, may be explain'd in a similar manner. For hydatids of both these viscera occur still more frequently, whether they are situated quite externally, such as Coiterus (*i*) found in a hang'd man, "under the spleen, of the magnitude of two fists, very full of "water, and separated from the neighbouring parts, without any injury," or entirely hid deep in the substance, like those which are spoken of as existing in the liver, by Glässerus (*k*), Diemerbroeck (*l*), and others.

To which class, you will certainly refer the observation of Lyserus (*m*), "of *citron-colour'd water, which burst forth in the quantity of more than three "pints," from the liver of a living jewess, when pierc'd deep in its substance; and that observ'd by Mauchartus, which I have already describ'd (*n*), and which he call'd "a dropsy of the spleen:" and thus you will observe, where it happens that the viscera are, at length, broken through, by a quantity of humour internally collected, how much they increase that dropsy, which existed before; and how much these viscera may seem to be corrupted, by the stagnant water around them, when they have been thus affected, by the fluid they contain'd. Whether, therefore, hydatids are of this second species, or of the first, or, finally, of a middle nature betwixt both, such as we chiefly attend to here; that is, so form'd in a viscus, as to shew themselves, in some measure, upon the surface also, they are, as I said, still more frequent in the liver, or the spleen.

So I saw two of this last kind, lately, in the liver of a certain old woman, which was, in other respects, sound, but had its anterior border of a figure which was never seen by me before, in this part, that is falciform, about the middle of it; and the left lobe produc'd almost as far downwards as the right. Under the membrane, which cover'd the convex surface, both the hydatids, in some measure, appear'd; the remainder of them being hid within the liver, one small, the other pretty large (*o*). Thus I observ'd a great number in the spleen of a sow, full of an insipid, or slightly-sweetish water. And thus in the liver of a second, one of the bigness of a cherry, not far from its edge.

(*d*) Sepulch. f. hac 21. obs. 55. §. 9.

(*e*) Eph. n. c. cent. 3 & 4. obs. 117.

(*f*) Epist. 16. n. 33.

(*g*) Obs. anat.

(*h*) Sepulchr. f. cit. obs. 12. §. 2.

(*i*) Obs. anat. cit.

(*k*) Sepulch. f. cit. obs. 4. §. 11.

(*l*) Ibid. obs. 19.

(*m*) Apud Bartholin. cent. 2. epist. med. 73.

(*n*) Epist. 36. n. 18.

(*o*) Vid. epist. 65. n. 8. in fin.

Yet in another, I found them of different sizes, and in great number; and not only, as in the former, half buried, but many of them even altogether hid, within the substance: and the water of them all was comprehended in a very thick, and white follicle.

This liver was extremely enlarg'd, and had the whitish net-work, by which the lobules are intercepted, very thick; and, for that reason, striking even the inattentive eye more than usual; whether you examin'd it internally, or externally. These lobules were found, as the other viscera seem'd to be: but the gall-bladder was extremely contracted, and instead of bile contain'd not many drops of a certain mucus, which was scarcely ting'd with any colour; so as to bring back to my mind, that "almost white colour" of the bile, which Vesalius (*p*) asserts he had seen, before Diemerbroeck, and after him others, who are likewise quoted in the Sepulchretum: and others since then, had seen instead of bile, a humour which was "white, lactescent, milky."

But not to digress from those hydatids of the spleen, and the liver, of which I was speaking; perhaps you will suppose those to belong to that species, which Hunerwolffius (*q*) describes, in human bodies, "as being *innate*, "or form'd within the liver, and spleen," besides others which he calls "*ad-nate*, or form'd upon these viscera," or those which to Horstius (*r*) appear'd "to be cavities full of water, in the liver, and spleen, of a little boy." And if you desire to know what symptoms had preceded in the living body, you will read them in another observation of the Sepulchretum (*s*), in which the same dissection is repeated: and in so long a section, as this twenty-first, it is less to be wonder'd at, than in most others, that it should have happen'd more than once (*t*): for which reason, and, at the same time, on account of the fraudulent descriptions of Blancardus, it might have been forgiven, that in the Additamenta those are set down again, as if they were new observations of this author (*u*), which Bonetus had produc'd before in this very section (*x*), and had ascrib'd to their true authors Jodonus and Parey (*y*); if, which even Blancardus himself had not done (*z*), one observation of Jodonus were not separated into two, the twenty-ninth, and the thirtieth; or rather if from the Scholium of Blancardus on the first, the second observation were not made. But the observation of Eggerdesus (*a*), which relates entirely to the thorax, ought not to have been introduc'd here by any means, where the question is of disorders of the belly only; or, at least, what is done in regard to two observations (*b*), that, like the former, do not refer to the present subject, ought not to have been omitted; I mean that notice was taken of the observations being produc'd, "out of their proper place."

43. I, however, have a very different reason for saying a few things here, of the thoracic viscera. For the viscera of the belly are not the only viscera

(*p*) Exam. obs. Fallop.

(*q*) Sepulch. obs. 4. cit. §. 14.

(*r*) In additam. ad eand. 21. sep. sect. obs.

82.

(*s*) Sect. ead. obs. 3. §. 12.

(*t*) Ibid. obs. 6. §. 7.

(*u*) Confer. obs. 4. §. 8. cum obs. 6. §. 12. obs. 20. §. 12. cum §. 17. obs. 21. §. 2. cum

§. 7. obs. 55. §. 2. cum §. 17; & §. 13. cum §. 16. et cæter.

(*x*) Obs. 29. 32. & fortasse aliar.

(*y*) Obs. 48 & 38.

(*z*) Anat. pract. rat. obs. 84.

(*a*) In addit. ad hanc sect. 21. obs. 61.

(*b*) Ibid. obs. 76 & 79.

that are liable to hydatids of this kind; and what seems to me to follow necessarily, to cicatrices: that these hydatids are form'd upon the lungs, and even upon the heart, I have already shewn, from the observations of the ancients, the moderns, and even my own also (*c*). If, therefore, any one of those cicatrices which I have defin'd, occur in either of these viscera, as one certainly did occur to me, on the external surface of the heart of a hare (and how frequently this species of animals is attack'd with hydatids, sufficiently appears even from the reading of Rhedi (*d*) alone.) What forbids me to account for a cicatrix, from the inanition, and coalition, of an hydatid, in the same part wherein I have seen an hydatid half-buried in the substance? Wherefore, you will, likewise, deduce the origin of cicatrices in the thoracic viscera, from hydatids; as I said in regard to the viscera of the belly.

And that the second species of these (*e*) is, probably, to be acknowledg'd to exist in the lungs, you will conjecture from the water collected within them, in a kind of sacs, as it were; which was twice seen even by the illustrious Senac (*f*).

44. But here you certainly expect from me another explication of the origin, not of cicatrices, but of certain hydatids; such, for instance, as were seen by Redi (*g*), in hares, not only buried, in clusters, within the substance of the liver, and tied one to another, but also under the external coat thereof, and of the whole alimentary canal; and between the membranes of the mesentery, without any cohesion therewith; and even many that were free, and quite unconnected, in the cavity of the belly, like animalcules, which could move themselves to and fro: so that it came into his mind, as it did into the mind of Tysonius afterwards, as I said above (*b*), to enquire whether they were certain insects, or rather embryos of insects; the latter of which conjectures I see is justly rejected by Tysonius; and the first, to omit other considerations, does not very well agree with the experiments, which have shewn that the very limpid water, whereof they are full, never coagulated by the application of fire. But Tysonius; although very fond of that first conjecture, not only for other reasons, but because the internal coat of his hydatids, which were taken from other animals, had no cohesion with the external, by which it was every where surrounded; has, nevertheless, confess'd that this external coat "was furnish'd with blood vessels:" and that all hydatids are not of this kind, particularly those which are found in the ovaria of dropical women, as they are made of enlarg'd vesicles (or, according to his hypothesis, of ovula) which are natural to these parts; and, in like manner, those which he saw burst forth from the right side of a woman (who was then labouring under disorder, but afterwards perfectly cur'd) when open'd a little below the spurious ribs; burst forth, I say, together with a great quantity of limpid water, to the number of five hundred; they being also turgid with a water of the same kind.

(*c*) Epist. 16. n. 33 & 44.

(*d*) Osservaz. int. agli anim. vivent. &c.

(*e*) N. 43.

(*f*) Traite du cœur, l. 4. ch. 3. n. 4.

(*g*) Osservaz. cit.

(*b*) N. 38.

Hydatids were after this found by Hunerwolffius (*i*), and Hartmann (*k*), by the former in a woman, such as, “besides a white, gummy liquamen, contain’d, in themselves, other more slender bladders full of lymph;” but by the latter, in a dog, within one and the same membrane, which was that of the omentum, many were found to be comprehended together, so that this membrane being pull’d away, the hydatids “rush’d forth with a slight pressure,” the liquor of which did not coagulate by boiling, yet had with it “a kind of coagulum;” and the coat which was proper to each, being made up of many other membranes, was so dense, that, when cut asunder, it did not collapse; and even felt as if it were somewhat fat, when touch’d by the fingers: of this fatty matter the hydatids, “when boil’d,” exuded a great quantity.

Neither were those, by any means, connected with each other, which that celebrated man, Alexander Camerarius (*l*), found in a considerable number, containing a limpid water, and comprehended in a membranous sac, wherein the steatoma of a man’s liver was, at the same time, included. As I have never yet happen’d to light on hydatids of this kind, I have chosen rather to point out to you, here, the observations of others; which you may easily compare together; than attempt an explanation of those things, which I had it not in my power to examine myself. This has been attempted by Hartmann, in regard to his, in the Scholium which he has added (*m*); but whether his hypothesis will please you, I am very much in doubt. You will rather ask, whether there are any things in the writings of other very learned men, that you can better approve; and especially among those, who have written of the inorganic formation of cystic tumours, or those who have often spoken, in these times, of vesicles swimming in the fluid of these tumours.

However, although in some hydatids I have seen, through their coats, what I have said above (*n*), and even, in a woman whom I have describ’d to you in a former letter (*o*), have seen the thin, internal coat of the hydatids furnish’d with whitish little vessels, and, in a fow, form’d into a kind of cells, as it were; yet I think that the vesicles which are met with by anatomists, and are full of water, are not all of the same kind, and, therefore, that the origin of different hydatids are to be differently explain’d: and the origin of some not, perhaps, in one way only, but in many join’d together. And I would have you, in particular, read over what the celebrated Morand (*p*) has seen, and conjectur’d, on the subject of those vesicles, which are found in great number, under one coat; either connected together, or unconnected, and swimming in a fluid similar to that which they contain, or pour’d out into the cavity of the belly.

45. And of this kind, in particular, I would have you suppose those vesicles to be, from which Aretæus (*q*) has said that a peculiar dropsy is form’d. That is to say, “certain very small vesicles, in great number, full of a fluid,

(*i*) In additum. ad hanc Sepulchr. sect. obf. 82.

(*k*) Ibid. obf. 83.

(*l*) Act. n. c. tom. 3. obf. 120.

(*m*) Ad cit. obf. 83.

(*n*) N. 37.

(*o*) Epist. 21. n. 47.

(*p*) Mem. de l’acad. r. des sc. a. 1722. & hist.

a. 1723.

(*q*) De caus. & sign. morb. diut. l. 2. c. 3. in fin.

“ and proceeding from the place, where an ascites is generally form’d,” which he might even see in the human body, when the parietes of the belly were pierc’d through, in order to draw off water; just as Tysonius, as I have said (*r*), saw them come forth, in great number, from another part, and as you will read that it happen’d, in some measure, to Morand (*s*). For as to Aretæus adding, that there were some, who “ affirm’d bubbles of this kind to have “ pass’d through the intestines,” into the cavity of the belly, this is the very case, if I am not deceiv’d, which he denies his ever having seen; and not this dropfy of which he gives the sign, as Peter Petit (*t*) believed (in conjunction with others) who thought, because he had not seen it himself, that Aretæus also could not have seen it.

But they who affirm’d those vesicles to have pass’d from the intestines, into the cavity of the belly, had, probably, found those appearances, in some brute animal, which I have said to be seen by Redi (*u*); the relation of which being understood in a manner somewhat different, as frequently happens by those who had heard it, so that these vesicles were suppos’d to have come from the cavity of the intestines, Aretæus might be induc’d to add immediately such things as had a tendency to show that the narration, thus understood, was improbable. However, the sign which he has produc’d of this dropfy, that is to say, when he writes thus, “ if you perforate the abdomen, you “ will draw off very little water; for the vesicle on the inside, prevents the “ effusion, by stopping up the orifice: but if you force your instrument into “ the vesicle, the fluid will again flow out; shows the insupportable difficulty there is to the removal of a disorder of this kind, unless the vesicles should happen to be situated in one place, or to be so dispos’d as they were in the woman spoken of by Tysonius (*x*); and, in like manner, in the dropfical rustic mention’d by Riverius (*y*): although, in general, where there is a dropfy from hydatids, or with hydatids, of whatsoever kind they may be, so that they are in great number, or large in their size, the abdomen is perforated in vain.

For besides that those which have already burst asunder, may go on to pour out a fluid, “ the opening of one vesicle,” as in pursuance of the hint of Tulpius (*z*), Thomas Bartholin (*a*) has rightly admonish’d, “ does not evacuate “ the rest, although they cohere, in the manner of bunches of grapes; and not only if they are disjoin’d one from another. Therefore, to the other causes why this chirurgical operation does not always answer, even at the time when all other circumstances seem to be favourable, add this also, because, to use the words of Ruyfch (*b*), “ as it very often happens that there are hydatids in dropfical persons, they seldom or ever recover, if the paracentesis of “ the abdomen is perform’d.” This he said on occasion of a dropfical woman, whose peritonæum, and mesentery, were both of them fill’d with hydatids. And that this happens, very frequently, in the mesentery of persons labouring under an ascites, is demonstrated, not only by other more ancient observations, but also by those more modern ones, contain’d in the volumes of

(*r*) N. 44.

(*s*) Mem. cit.

(*t*) Comment. in cit. locum.

(*u*) N. 44.

(*x*) Ibid.

(*y*) Obs. hinc ind. decerpt. 15.

(*z*) L. 2. obs. med. c. 34.

(*a*) Act. Hafn. vol. 1. obs. 8.

(*b*) Thef. anat. 7. n. 37.

the Cæsarean Academy (*c*). But in regard to the hydatids of other parts which are in the belly, as I have produc'd quite a sufficient quantity of examples already, I will add one of the stomach, from Jacobus Yongius (*d*), in that woman whose wonderful case you cannot explain, unless you should have your eye to that cause which we generally have an eye to, in the diabetes. For as, through the whole course of the disease, she made almost as much water as she drank of fluids, it does not well appear from whence the water could proceed, two hundred and fourteen quarts whereof were discharg'd within eight months, by the operation of the paracentesis, which was repeated to the nine and twentieth time, in that space. This woman, therefore, had a great number of hydatids on the stomach, and intestines.

46. As the observations which I have, relative to the tympanites, will come in more conveniently on a future occasion, by reason of the disorders complicated therewith, I shall choose to subjoin, in their stead, two which relate to the dropy of the peritonæum; a disease (to premise a few things upon that head) which has, in fact, not been describ'd by the most ancient authors, nor yet was first spoken of by Tulpus (*e*), nor Bogdanus (*f*), as they themselves seem'd to believe, and most authors have suppos'd. I do not say this, because Stratenus had said to Tulpus, that he had seen something very similar to it, as Tulpus himself readily confesses; nor because Stalpart (*g*) affirms that something of this kind was said by Marcellus Donatus.

For Marcellus (*b*), although he shows, in opposition to Fernelius, that the waters, of hydropic patients, are brought by invisible passages into the cavity of the belly; and says that, although this cavity is the more proper receptacle of these waters, "it is nevertheless prov'd, by dissection, that betwixt the peritonæum, and the other parts which constitute the lower belly, a portion of water is very often found." And that you may be in no doubt what these other parts are, he immediately adds this which is very improperly omitted by Stalpart: "so that some of the followers of the Arabians contend, that the general situation of the water, in an ascites, is betwixt the siphac and the mirach" (that is betwixt the peritonæum, and the parts that lie in contact with it externally) "and we even see, that in those who are troubled with this disorder, the water reaches to the hips, the legs, & cæt." From this instance then, you see what portion of water he supposes to have been found even in those parts; that is to say, the water which naturally reaches thither, when an anasarca is join'd with an ascites.

For in regard to that opinion of some, who differ, very widely, from their teachers, Haly (*i*), and Avicenna (*k*); neither is this observation proper to prove it, nor is any other produc'd by Donatus: although Stalpart says that Donatus, after having asserted a dropy to be sometimes brought on by drinking plentifully of cold water, if "it be carried into the humid perito-

(*c*) Dec. 3. a. 9. & 10. obf. 239. & cent. 3 & 4 obf. 117. & act. tom. 2. obf. 34. & cæt.

(*d*) Vid. in act. erud. Lipf. a. 1713. m. jul.

(*e*) L. 4. obf. med. c. 44.

(*f*) Obf. anat. chir. 11.

(*g*) Part. 1. cent. 2. obf. rar. 28. in schol.

(*b*) De med. hist. mirab. l. 4. c. 21.

(*i*) Theor. med. l. 9. c. 31.

(*k*) C. 5. supra ad n. 33. cit.

"næum," that Donatus, I say, continues to speak, as follows: "Jacobus Camenicensus in his letter written to Andr. Matthiolus, in the fifth book of his epistles, tells us of a certain person, in whom water had been collected betwixt the coats of the peritonæum, and of the intestines." For Donatus (*l*), after having copied from Aretæus (*m*), who is expressly quoted, those words that relate to a fluid being then carried into the peritonæum, not to be collected there, but that from thence "the drops may be effus'd into the ilia," to produce an ascites; which drops were before converted into "vapour, and carried off by transpiration;" after having copied these words then, likewise, and having added many other things, which by no means relate to the peritonæum, but to the imbecility of the viscera, in persons who labour under an ascites, and to the obstruction of the veins of the liver; in order to prove this he at length makes use of that observation, of Camenicensus, of stones obstructing those veins, in a dropical man," in "whom water had been collected, between the peritonæum, and intestines."

For thus Donatus himself, with justice, writes, as Matthiolus does also, when, in his answer to Camenicensus, he interprets these words of his, "when we had gone through the muscles of the abdomen, we found that kind of water, which is call'd citron-colour'd, betwixt the peritonæum, and intestines: which however I see is doubted of by some;" that is by the followers of the Arabians, who were just now spoken of, and who thought that the water, of patients in an ascites, was not betwixt the peritonæum, and the intestines, but betwixt the peritonæum, and the external parts. And these inquiries I have prosecuted the more fully, because I find that many have ascrib'd the observation of the dropsy of the peritonæum, to Camenicensus, and Donatus; without turning to these authors; and in conjunction with Stalpart, whom they have follow'd without mentioning his name; among whom is Nuck (*n*), and he who has said that he had compar'd his own observation of this disease with that of Donatus, which is no observation at all.

47. Who then, do you say, found this appearance before Nicolaus Tulpius? Joannes Acholzius, a physician, and primary professor, at Vienna. For this gentleman, in the year 1581, having presid'd at the dissection of a dropical woman, in the presence of the imperial physicians, and surgeons, found a great quantity of water, like a lixivium, not in the cavity of the belly, but betwixt the peritonæum, and the integuments of the belly; the muscles, that is to say, being so far extenuated by the distention of the water beneath, that, as is often the case, "they seem'd to be almost annihilated;" or being even, in some measure, chang'd into a certain continued body, made up of vesicles, fill'd with water, mucus, and glandular matter, which compos'd the anterior paries of that very large sac: whereas the internal was made up of a membrane, with which all the viscera were cover'd, in such a manner, that before this was cut into, there seem'd to be no viscera at all.

Read, I beg of you, the observation more fully describ'd in this section of the Sepulchretum (*o*), although confus'd with circumstances relating to other subjects, and you will very plainly perceive, that this was a dropy of

(*l*) C. 21. cit.

(*m*) C. 1. ad n. 45. supra cit.

(*n*) Ade. cur. c. 9.

(*o*) Sect. 21. obs. 21. §. 16.

the peritonæum, from water flowing out of these glandular tumours; to the disorder of which, and of this membrane, those miserable pains, wherewith, upon the great increase of the disease, the woman had been continually tortured, are certainly to be ascribed. Nor was this history first publish'd in the Sepulchretum, but was extant from the year 1598 among the *Consilia Medica*, publish'd by Scholzius (*p*); that is in a book, which went through more than one edition, and which was in the hands of almost every one: particularly in the last age.

But I have even observ'd other observations in the Sepulchretum, which were made before that of Tulpus; and which may, or ought to be, refer'd to the same disease: although nobody has ever yet taken notice of them, as far as I know, at least, when he was mentioning the others. That of our Spiegelius perhaps may, who, when he was in Moravia, remark'd "a spurious dropfy," in a woman, "betwixt the abdomen properly so call'd, and the muscles which are curv'd inwards as it were." (Should he have said were curv'd inwards? Or was the case as it is in the observation of Acholzius?) From thence (which circumstance is omitted in the Sepulchretum) "ten pints of a black fluid flow'd." This was done in the year 1614, altho' it was publish'd by Rhodius (*r*) forty-three years after.

But, unless I am greatly deceiv'd, that which Hoechstetter (*s*) had observ'd in a noble virgin, belongs entirely to the class I speak of: this observation was made in the year 1628, although publish'd many years after by his grandson; and although the author suppos'd the anterior part of the sac, wherein a great quantity of thick and fœtid humour was contain'd, to be the peritonæum, and the other part, wherein he found many glandular tumours, among which four of the largest were purulent, to be the omentum. For as he says that this internal part of the sac was "a membranous expanded body, wherewith all the viscera and the intestines were cover'd," I believe that it was the peritonæum, notwithstanding it might possibly have the omentum agglutinated to it. But this you will better judge of yourself, for you have both an observation, and a scholium, in the Sepulchretum (*t*), in which some parts of this history are contain'd.

48. And I would moreover have you read, very attentively, in the same book, two observations of Paawius (*u*), and one of Dodonæus (*x*): and when you read them I would have you observe, whether any suspicion begins to arise in your mind, that any one thereof relates, in some measure, to the disorder whereof I treat at present. For Paawius, in two hydropic women, one dissected in the year 1601, and the other in the year following, found "not the least traces" of the spleen, kidneys, and liver itself; except that, in one of them "the venous ducts only," of this last-mention'd viscus, "remain'd, and they but very few in number."

How much less surprizing is it, if we suspect that the peritonæum was distended by a great quantity of water; and that, inwardly, in these places

(*p*) Conf. 339.

(*q*) Sect. cit. obs. 12. §. 6.

(*r*) Cent. 3. obs. med. 6.

(*s*) Obs. med. dec. 10. cas. 7. cum schol.

(*t*) Obs. cit. 12. §. 2.

(*u*) Sect. cit. obs. 70. & 71.

(*x*) Ibid. obs. 20. §. 10.

where it happen'd to be most attenuated, and less connected with some of the viscera, it had burst; and that where it was not thus attenuated it had remain'd; and that therefore some of the viscera appear'd, in some measure, but others were entirely hid; and that these few veins belong'd to the peritonæum itself (y): and that Paavius, in a very hasty "opening of the belly," as he himself says it was, the bodies being in a very bad state, had not inquir'd accurately into the case. And Dodonæus, in regard to a woman who had been troubled for two years, with a very considerable tumour in her belly, which when open'd did not discharge water, but black intestinal fordes, like those which have lain in dunghills; and these in the quantity of more than sixty pounds; readily confesses, that, in such a confusion of filthiness, it was not possible to find out from what injur'd intestine they had proceeded; yet that all the viscera, except the omentum, which had been dissolv'd into putrid fragments, were entirely found: but that the peritonæum was fissur'd, in some places, from the superior to the inferior parts.

Here, I confess, it is not at all to be wonder'd at, that the fæces had flow'd out of the intestine, which was at length injur'd, and had polluted the waters of a dropsical woman, which had been long-collected. But it is very surprizing, that so large a tumour of the belly had afflicted the patient for so long a time, "with a healthy-colour'd countenance, without any "marks of disease appearing in the urine," and without any swelling of the feet. These are marks, as we shall see below (z), of the dropsy of the peritonæum, wherewith this also agrees much more easily, that the viscera should preserve their soundness for so long a time. Moreover, that the peritonæum, being driven inwards, may adhere to some intestine, and communicate its disease in such a manner, as to suffer the fæces to pass over into the fluid with which the peritonæum is distended, the observation of the celebrated Chomel (a); which was taken from a woman also, whose belly, like the other woman's in question, had begun to swell after child-birth; demonstrates.

I should suppose, therefore, that you may easily suspect the peritonæum to have been, at length, burst asunder, as they saw it; and an ascites to have been suddenly brought on, from a long dropsy of this membrane (b); and that the injury of the intestine being increas'd at the time of this rupture, the fæces had, during the latter days of the disease, flow'd in great quantity into the cavity of the belly. And this observation of Dodonæus was publish'd by him, together with others, in the same year in which Acholzius made his; that is in 1581: for it is very evidently a typographical error, where, in *Lindenius Renovatus*, his observations are said to have been publish'd in the year 1518, as it is acknowledg'd that the author was born in the year 1517: which is a circumstance I should have taken no notice of here, if I had not observ'd that the same error had also pass'd into the *Bibliotheca Scriptorum Medicorum*.

An observation was also extant in Riolanus (c), and not only in the last editions of his *Anthropographia*, "of water being extravasated betwixt the pe-

(y) Vid. infra, n. 56. in fin.

(z) N. 58.

(a) Mem. de l'acad. r. des sc. a. 1728.

(b) Vid. infra n. 52.

(c) Vid. supra n. 33. in fin.

“peritonæum, and the muscles of the abdomen.” But lest you should say that it ought to be explain’d, in the same manner as I have explain’d those words of Donatus (*d*), I chose rather to pass over it in this place.

49. Finally, in the year 1651, the disease we are speaking of, was seen by Tulpius, and soon after communicated to the public, under the new name of *Hydrops Peritonæi* (*e*); in which publication it is expressly affirm’d, “that all the congeries of waters had lain betwixt the two coats of the peritonæum, which had put on the thickness of the ring-finger.” The same history, lest you should, like a certain person, believe it to be another, was publish’d afterwards by him who dissected the body, Job Meekren (*f*); but he publish’d it more at large, and told us that Walæus was the only one, out of so great a number of physicians, who had conjectur’d the true situation of this dropsy, while the patient was yet living. Nevertheless, Tulpius has something which is not to be found in that more full description: for which reason his description might also have been transfer’d into the Sepulchretum, and that distinctly from the other; rather than that one should have been made of them both, as you will see is done by Stalpart (*g*), in such a manner, that you are often ignorant what Tulpius, and what Meekrenius, has said.

Bogdanus (*h*) also, in a woman dissected by him, observ’d the peritonæum to be “of the thickness of a man’s thumb, rugous and rigid;” which circumstance, together with the remarks that are immediately added of the viscera, are very improperly omitted in the Sepulchretum (*i*). But he has asserted that there was a fluid like lees of oil, not contain’d betwixt the coats of the peritonæum, but “contain’d betwixt the coat of the muscles of the abdomen, and the peritonæum.” That is to say, what Tulpius, and most others after him, took for the exterior lamina of the peritonæum, he took for the coat of the muscles, with Berengarius (*k*), who taught formerly thus: “It is true that, as far as appears to the senses, there is one very thin pellicle, betwixt the true siphac” (that is the peritonæum) “and the broad muscles of the belly; particularly in the fleshy part of the muscles: which pellicle is the panniculus that involves the muscles, and other parts round about.”

And I see that this pellicle is now suppos’d, by many, to constitute, in part, the cellular texture of the peritonæum; which cells being ruptur’d by the distending water, a cavity is made “betwixt the peritonæum, and the tendons of the transverse muscles,” or, as others more properly say, “and the transverse muscles.” But whether the peritonæum has no exterior lamina, besides this texture; or whether this texture, itself, may not be call’d a lamina, it is not a proper occasion now to enquire. It is sufficient to have shown, that, before these latter times, there were not wanting such as plac’d the seat of this dropsy betwixt the peritonæum, and the muscles. It is true, in what year Bogdanus wrote these things I do not know: but they were, however, publish’d by Bartholin (*l*), in the year 1665. Yet even

(*d*) Supra n. 46.

(*e*) Obf. supra ad n. 46. cit.

(*f*) Obf. med. chir. c. 52.

(*g*) In schol. supra ad n. 46. cit.

(*h*) Obf. ibid. cit.

(*i*) Sect. hac 21. obf. 12. §. 4.

(*k*) Comment. 5. in Mundin. anat.

(*l*) In 2. edit. cultri anat. Lyferi.

twelve years before, it was not doubted by Olaus Rudbeck (*m*), but a drop-fical tumour might be generated “ betwixt the muscles of the abdomen, “ and the peritonæum.” And in the year 1667 Gerard Blasius (*n*) found water in the body of a virgin, “ betwixt the muscles of the abdomen, and “ the peritonæum.”

Yet this author thought that the same thing might also happen, betwixt the two laminæ of the peritonæum. And this would be said to have happen’d in most of the observations, if they who say that the cellular contexture is broken asunder, had not in their power to answer, that the external part of this texture, which adheres to the muscles, is frequently, at that time, become so thick, and so dense, as to be taken for another lamina of the peritonæum, and even sometimes for the whole peritonæum: which seems to have happen’d to Hoechstetter (*o*), and others, among whom is Paulus Mothius, whose observation on a matron is so propos’d by Bartholin (*p*), as if a great quantity of water had been collected betwixt the peritonæum, and a pretty dense membrane covering all the viscera, and filled with copious and large veins; in which membrane, a large abscess had been form’d about the region of the liver: whereas three lesser abscesses occupied the lower part of the membrane, near to the groins.

This observation was publish’d in the year 1657. And I have pointed out the year in which every one of the observations, that I have mention’d, was made public: in order to convince you, that the greater part of them were in the hands of all persons, before the year 1688: in which year Drelincurt was created public professor, in that place, where one of his disciples, when he wrote at large, that history of the dropfy of the peritonæum, received from Drelincurt, which is added, in the additamenta, to this section of the Sepulchretum (*q*), has said what is quite unworthy of his very learned preceptor, “ that not the least shadow of a similar event is extant, either among the ancients, or among the moderns, the celebrated Tulpus only excepted.”

50. But now it will be sufficient to point out the observations of this dropfy, which were publish’d from that year 1688, quite down to the year 1692, in which Nuck (*r*), the successor of Drelincurt, publish’d his own; which had been before communicated to Stalpart, and publish’d by him (*s*). And there were, besides those of Hoechstetter, and Blasius, which I have spoken of above (*t*), the three which you will see are, as most of the others are, transfer’d into the Sepulchretum (*u*), from Scultetus, Helwigius, and Spornius: to these you will add one of Kniselius (*x*), which you will not be surpriz’d to find omitted in the Sepulchretum, when you observe that the observation of Nuck is wanting also! and from the time that Nuck (*y*), by his skill, and industry, illustrated this disease, there came out, in the first place, three observations which are copied in the Sepulchretum, one of Gahrlepius (*z*), a

(*m*) Exerc. anat. exhib. duct. hep. aquos.

c. 9.

(*n*) P. 1. obs. med. 18.

(*o*) Vid. supra n. 47.

(*p*) Cent. 4. hist. anat. 25.

(*q*) Obs. 41.

(*r*)

(*s*) Cit. supra ad n. 46.

(*t*) N. 47. & 49.

(*u*) Sect. hac 21. obs. 12. §. 1. & in addit. obs. 25 & 48.

(*x*) Apud Zeller. diff. de vas. lymph. admin.

c. 1. n. 13.

(*y*) C. supra ad n. 46. cit.

(*z*) In cit. addit. obs. 81.

second of Drelincourt, which I mention'd just now (*a*), and a third of Simon Zylius, which is join'd with the last.

But the other observations could have no place in the Sepulchretum, in consequence of their being publish'd after the second edition thereof; that is to say, those which were given by several authors, one by each: as by Littre (*b*) in the first place, who added an explanation of the disease, its signs, prognosis, and cure, with more accuracy than others to that time; and afterwards by Hieronymus Laubius (*c*), Lucas Schrockius (*d*), John Palfin (*e*), from the communication of Favelet, and by other celebrated men, as Jo. Georg. Hoyerus (*f*), Jo. Hermann Furstenau (*g*), Jo. Christoph. Pohlius (*h*), and, finally, by Jo. Henr. Respingerus (*i*). The observations, therefore, of these authors, and of all those who are mention'd above, were in my hands, when I said to you, and did not in the least doubt, but others might exist besides, both of the antients and the moderns.

Among the rest, nevertheless, do not imagine that I here forget to recount the observation which Chomel (*k*) has given, greatly to the praise of his skilfulness and dexterity, where he also adds a second; but both of them taken from the living body only. I, however, in this recital, according to the order of time, have purposely omitted to number them amongst the others, as I also have, two in particular, which were produc'd by Nuck (*l*); one from Bartholin, as if it had been his, and not Brechtfeld's; and another from a physician who was his friend; not because I judge them to be without their usefulness to those who treat of this disease (for I myself have made use of one of them, as far as was proper, above, and shall perhaps make use of one below) but because neither of them is confirm'd by anatomical inspection.

But these four last-mention'd observations, and others of the same kind, which will be produc'd below, were taken from women, as the others were also; not only those that are pointed out by Rudolphus Jacobus Camerarius (*m*), who had taken notice of the very same thing, but all the others, moreover, that have hitherto been mention'd by me, or will be mention'd hereafter: inasmuch that as yet, if you except just one example (*n*), a dropsy of the peritonæum has not been observ'd, except in the female sex. Of which circumstance, and of others, that I have peculiarly observ'd, in comparing so great a number of histories with each other, I shall say something presently, after I have first, of all the Italians, as far as I know, added the two histories which I promis'd you; lest you should suppose, that, as out of all these women there was no Italian, our women are not subject to this disorder; which is pretty rare indeed, so that neither Valsalva, nor I, have hitherto lit on it in dissection; yet not so rare, but that our Mediavia has seen it twice in this hospital, and communicated both of the observations to me, in the following manner.

(*a*) N. 49. in fin.

(*b*) Mem. de l'acad. r. des sc. a. 1707.

(*c*) Eph. n. c. cent. 4. obs. 162.

(*d*) Earund. cent. 5. obs. 23.

(*e*) Anat. du corps hum. p. 1. tr. 2. ch. 4.

(*f*) Act. n. c. tom. 4. obs. 32. & tom. 5. in obs. 68.

(*g*) Earund. t. 8. in obs. 78.

(*h*) Ibid. obs. 111.

(*i*) Act. Helvet. vol. 1.

(*k*) Mem. de l'acad. r. des sc. a. 1728.

(*l*) C. cit.

(*m*) Biga obs. med. c. 1.

(*n*) Vid. n. 59.

51. A woman not yet advanc'd in age, and of a good complexion, had a tumour of the whole belly. She said that before this happen'd to her, a kind of tumour might have been felt at the left side of the navel, unequal in its surface, and of such a magnitude, that it equall'd almost the breadth of her hand, when laid upon it. When she was suppos'd by some to have an ascites, for this very reason, which was doubted of by others on account of the natural colour of her face, she died.

The transverse muscles of the abdomen being cut into, a great quantity of very stinking water burst forth, which was separated, from the cavity of the belly, by the peritonæum. This being exhausted, the tumour of which the woman had spoken came into view; having been generated in the peritonæum, and consisting of two or three large bladders, as it were: the parietes of which were so thick, that upon drawing out the water they contain'd, they did not at all subside, or collapse.

52. Another woman, about twelve years after the former, that is in the year 1725, came into the hospital in consequence of her being troubled with a disease no less inveterate, but even more so. For she said that when she was forty years old, and she was at this time in her fiftieth year, she was troubled with certain tumours in the upper part of her belly, which lay at a distance from each other, and were not free from pain, if they were touch'd: and that these tumours, notwithstanding a great number of different remedies were applied, both externally, and internally, had increas'd; and she had continually grown worse. Even then, although the whole abdomen was distended, it was easy to distinguish the tumour with the eye, as well as with the hand; for the tumours that had been before disjointed, had coalesc'd into one unequal tumour, which, when touch'd, gave pain, and was plac'd betwixt the cartilago ensiformis, and the navel: yet so as to touch neither of them. The colour of the skin, in that part, was the same as in others: and if you attempted to lay hold of it with your finger, and raise it up, you could not do it; so that, for this reason, some suppos'd the tumour to be in the muscles of the abdomen themselves. But others; considering the colour of the countenance, which inclin'd to yellow, and the very great difficulty of respiration of which the woman, in particular, complain'd; suppos'd it to relate to some disorder of the viscera. Yet there was no mark of the stomach or intestines being injur'd. In the mean while, black vomitings being added to the slight fever with which she was troubled, death put an end to her miserable life.

The integuments, and muscles of the belly, which was observ'd to be less tumid than it had been in the living body, being accurately separated; and with these even the tendon of the transverse muscles; a thin membrane appear'd to lie under the tendon, and flesh, of these muscles, between which, and another, that in thickness was equal to one line of the inch of Bologna, was comprehended a cavity containing a tumour, not only form'd on the external membrane, but also extending itself downwards, and to both sides; so as to contain a great deal of water, in colour like to that wherein fresh meat has been wash'd, of a very filthy smell, and of a purulent thickness, in the part where it had subsided: the quantity of this water might be computed

at about thirty pints, not so much from that which was found in this cavity, as from what had been extravasated into the cavity of the belly; the lower membrane, of this morbid cavity, being eroded over against the stomach: and this I suppose to have happen'd about the latter end of the disease, from whence the abdomen appear'd to be less tumid.

However, this peculiar tumour of the epigastrium was made up of a firm, and hard substance, of a white colour inclining to yellow, wherein a few cells were, in some places, observ'd. And the membranes, surrounding the cavity, had already begun to be eroded in more places than one, and to grow black on the surfaces, by which they were turn'd towards each other; and on the same surfaces they were rough, and unequal. But on the surface, by which the lower membrane was turn'd towards the belly, it was smooth, unless where any part of the omentum, and the large intestine, was connected to it; which connection, however, was not very firm. There was, also, a kind of small rope, as it were, connected, on one hand, with the same membrane, and on the other, with the lower vertebra of the loins; which, when dissected, pour'd out blood. Moreover, the intestines were in some measure inflam'd: but the omentum, and the other parts of the belly, were sound; if you except the liver being of a pallid colour, and grating, as it were, under the knife, as if sandy particles had been mix'd with its substance.

53. Now since we have a sufficient number of observations on the dropsy of the peritonæum (to set aside those which leave some room for doubt) to compare one with another; it is somewhat less difficult to add a few things in relation to the causes, nature, symptoms and cure thereof.

In relation to the causes therefore; where Nuck (*o*) has said that the branches of the lymphæducts creep betwixt the muscles of the abdomen, and the peritonæum, as Rudbeck (*p*) had also said; and even has clearly demonstrated, that they run betwixt the two laminæ of the peritonæum; and pursued his invention, by supposing that these branches, being obstructed, from any cause whatever, are form'd into hydatids, from which, when ruptur'd, a dropsy of the peritonæum arises; he has immediately, also, added this, that gluttons, and women who bear children, are particularly liable to this danger of obstruction.

For that, in both of these classes, the muscles of the abdomen, being immoderately distended, give a resistance, on one hand; and, on the other, the stomach, and intestines, or the uterus, by its fullness, force outwards; so that the lymphatic vessels being intercepted betwixt this pressure, and that resistance, it is easy for us to conceive, that some of the nearest branches, of these canals, may be sometimes so distended, by the retarded lymph, as to be burst asunder. And indeed in many of the observations just now quoted, we read that this dropsy had happen'd to those women, who had been mothers of many children; and even to some a little after abortion, or a difficult birth, as in the observation of Kniseliuſ (*q*); and indeed immediately, or almost immediately, after birth, as in the observations of Dodonæus (*r*),

(*o*) C. 9. supra ad n. 46. cit.

(*p*) C. 9. supra ad n. 49. cit.

(*q*) Cit. supra ad n. 50.

(*r*) Cit. ad n. 48.

and Chomel^(*); if you think that they really and strictly belong to this class.

Yet, although I readily admit uterogestation among the causes of this dropsy, I cannot, however, understand why this disorder has been but once observ'd in any other bodies, but those of women. Nor were all these patients child-bearing women: and she, of whom Furstenavius *(s)* gives the history, was certainly barren; as many of them were virgins, which is demonstrated by the histories of Hoechstetter *(t)*, Stratenus *(u)*, Drelincourt *(x)*, Schröckius *(y)*, Palfin *(z)*, Hoyer, *(a)*, and even Tulpius *(b)*: for the woman describ'd by him had always, even before she married, had, "from her early years, a very tumid state of the belly," as is related by Meekrenius *(c)*. Shall we therefore return back to that other cause, and suppose all these virgins to have been great gluttons? But this is not even a vice that happens among women, except very rarely; and as to the males among whom it frequently happens, we know of no more than one hitherto, who has been found to be affected with this disorder.

54. You will conjecture, perhaps, that another cause ought to be added, which is peculiar to women; especially that which Camerarius hints at *(d)*, when he says that he had read "in almost all" the histories of this disease, that the bag, in which the water was contain'd, had been connected with the side of the uterus in particular, or its appendages; therefore that he, in the woman describ'd by him, had deriv'd from thence, the origin of the bag, which was not so much connected in any other part, as in the seat of one of the ovaria, and of the tube, which two parts were likewise wanting. Thus his son, also, after that *(e)*, describ'd the beginning of another bag connected with the right ligaments of the uterus, and the right ovarium; or rather with their situation, or remains, as they themselves were obliterated.

But I see that Meekrenius *(f)* had, before, observ'd the same ovary to be deficient; and even its tube producing itself into the peritonæum, of which the bag consist'd, and degenerating into it; as he has represented by a figure: and that Gahrlepius *(g)* had made use of this very same word, when he signified that the same parts, and the ligament which lies betwixt the ovary, and the tube, were carried away into the peritonæum, which was continued from thence, and in which many bags were comprehended. I omit others, and among these Laubius *(h)*, by whom the sac of the peritonæum, which he describes, is said to have a very firm connexion about the fundus uteri, though easily separable in other parts, by the fingers alone: and even Littré *(i)*, the interior membrane of whose sac was connected with no other viscus, but with the extremity of the left Falloppian tube; which being firmly fix'd to it, had been so stretch'd as to become twice as long as it naturally is.

But I cannot help taking notice of Sponius *(k)*, as the observation he has communicated speaks of a sac, that could not only be separated from all the

(*) Cit. ad n. 48.

(s) Ad n. 50.

(t) Ad n. 47.

(u) Ad n. 46.

(x) Ad n. 49.

(y) (z) (a) Ad n. 50.

(b) (c) Ad n. 46.

(d) Ad n. 50.

(e) Act. n. c. tom. 1. obs. 160.

(f) Cit. ad n. 46.

(g) (h) Ad n. 50.

(i) (k) Ibid.

viscera without laceration, except from the same tube from which it was continued, but even communicated with the cavity of the uterus, so that the patient had a continual dripping, from her genital parts, of a serum of the same kind with that which the sac itself contain'd, in the quantity of a hundred and forty pints; the communication being also confirm'd by the probe, it seem'd probable that the tube had produc'd its parietes into the parietes of the sac. And Camerarius the father, who had mention'd most of these also, hinted at a method, after some one of our countrymen, by which, if the return of the blood, from the ovary, is obstructed in the spermatic vein, the serum may, by its secession from hence, in consequence of its creeping betwixt the two laminæ of the peritonæum, insinuate itself between these two laminæ, according to the experiment of Lower (*l*); and thus, by disjoining them, begin to form the sac.

But notwithstanding I acknowledge these observations to be true; and even confess the cause, if explain'd a little more fully, and accurately, than I have done here, to be probable also; and see that it may be, likewise, farther transfer'd to other veins, sometimes, that run in this situation; yet we either conceive, or know, that the ovaria, the tubes, and the uterus, were quite unaffected in this dropfy, according to the observations of Helwigius (*m*), Knifelius (*n*), Pohlius (*o*), and Mediavia (*p*): and what relates still more to the subject in question, it is not certain that they were diseas'd in any of the virgins who have been spoken of, if you except one: and even it sufficiently appears that they were not affected in most of these patients, as all the viscera of the belly are said to have been sound. Since these then were not child-bearing women, nor had any thing in the uterus, or its appendages, which could give an origin to this disease, that was peculiar to women; it is evident that it is necessary to add some other causes, to those two which I have mention'd, that are either proper to the female sex, or are more common among that sex than ours.

55. But while you are inquiring after others, I will reckon up a few; as, for instance, the conflux of the blood, every month, into the inferior parts of the belly; their sedentary life, which is not quite so proper to promote its return; the more weak resistance of the female body, against causes of disease, whether external or internal; and, in conjunction with this, that most vile and detestable custom of confining the belly with stays, especially when they are hard and stiff; vile and detestable custom, I say, because no disapprobation can be more severe than the extreme mischief of them requires.

For to add, to the other instances of detriment caus'd by stays, that are taken notice of by the celebrated Winslow (*q*), this over and above; while the lower part thereof continually, and closely, compresses whatever part of the abdomen lies betwixt the terminations of the thorax, and the upper edges of the ossa ilia, it is easy to conceive, what an obstruction is thrown in the way both of the lymph's, and the blood's motion, in those vessels also, which are betwixt the muscles, and the peritonæum; especially where the stomach and intestines; being distended with flatus, at least, if not with meat

(*l*) Tract. de corde c. 2.

(*m*) (*n*) (*o*) Cit. ad n. 50.

(*p*) Supra n. 52. in fin.

(*q*) Mem. de l'acad. r. des sc. a. 1741.

and drink; force out the abdomen from within, and press it against these stays.

But if the lymph or the serum be not, for this reason, extravasated into that interstice, in the manner I have mention'd (*r*); particularly in those, whose fluid or firm parts are dispos'd to it more than they are in other persons; yet it may happen to the same persons, that some part of the retarded lymph, or blood, may form the beginnings of tumours in those parts, which, being increas'd after a long time, may divide the peritonæum from the muscles, in such a manner, that the branches of the lymphatic vessels, being pull'd away, or ruptur'd, may bring on that dropsy, which the constriction, and pressure, had not, of themselves, brought on: and the same branches being, at length, brought to suppuration, may increase the dropsy by purulent ichors. I perceiv'd tumours of this kind, by examining the epigastrium with my hand, in a matron of rank, who had been compell'd to wear stiff stays, from the time of her being quite a little girl; and those so much the stiffer, and more tightly lac'd, in proportion as her relations were more afraid of her being distorted: these tumours were as yet small and at a distance from each other; and I immediately persuaded her to wear stays that were less stiff, and in a different manner.

You yourself might see, in what region of the abdomen, the same tumours, now grown large, had been form'd, in the two women whose histories I last gave you (*s*). Nor, indeed, were the tumours, or abscesses, in any other region, which Laubius (*t*) found to the number of six; nor the larger of those four which Mothius, as is said above (*u*), found growing to the sac. But you will not be at a loss to conceive, how those which occupied the inferior parts of the sac, in the same observation of Mothius, or in the observations of Nuck (*), and Littre (*x*), might possibly derive their origin from these stays; when you call to mind the lower parts of them, and the stiff-pointed part, which is added to the middle of them before, in a longitudinal direction: for by these the region of the abdomen is compress'd, and all the vessels that lie there, whether lymphatic, or sanguiferous; and particularly when the woman is in a sitting posture.

56. As among the causes of this dropsy, we have admitted tumours form'd in the peritonæum, which not merely by pulling asunder the parts, as I said in pursuance of the opinion of others only, or by laying an obstacle to the motion of the lymph, and blood, may bring on this disease; but also may, when they are suppurated, increase it by the addition of deprav'd ichors; we may easily understand this to be a corollary taken from thence, that, in order to explain the putrefaction, stench, power of eroding, and creating pains, which are often found to exist in the collected water, it is not always necessary to accuse the long stagnation of that water; on account of which the saline, and sulphureous, particles may be separated from the others, and occasion these effects. But if stagnation could always do this, it would certainly have done it in a great degree, after four years, after ten, after many more, as in the observations of Camerarius the father (*y*), of Schröckius (*z*).

(*r*) N. 54.

(*s*) N. 51. & 52.

(*t*) Cit. n. 9.

(*u*) N. 49.

(*) (*x*) Cit. n. 50.

(*y*) (*z*) Ibid.

and of Meekrenius (*a*): yet in these observations were none, or scarcely any, of these symptoms observ'd. And there had even been neither tumour, nor abscess.

However, tumours do more frequently appear, either form'd of a glandular matter, or dispos'd in the manner of cells, bladders, or globules, as you will see remark'd by Acholzius (*b*), Hoechstetter (*c*), Bogdanus, (*d*), Knifelius (*e*), Mothius (*f*), Littre (*g*), Respinger (*gg*), and Mediavia (*b*); and these either in great number, as by the first four, or even, in some places, so gather'd together into a heap, that, according to the observation of Acholzius, "they were equal in thickness to the breadth of a man's hand." And Malpighi (*i*), where he, in some measure, led the way to the explication of Littre; asserted it to be owing to the glandular nature of the membrane of the peritonæum, that, in this disease, "notwithstanding the dilatation, it becomes more thick than is natural:" for he says that this is "the property of glandular follicles, when affected by disease:" and, indeed, if you read Schröckius (*k*), Laubius (*l*), Sponius (*m*), Drelincurt, (*n*), Nuck (*o*), and Littre (*p*), you will see how much it has been found to be thicken'd; and still more if you read Knifelius (*q*), who, in one place, saw it, "of the thickness of half an inch;" but still much more, if you call to mind those things that I related to you from Tulpus (*r*), and Bogdanus (*s*).

Therefore, if you should choose rather to account for this increase in thickness, in the way of Malpighi, you will easily conceive how much the secretion of the included humour is increas'd, in consequence of an increase in the secreting organs; especially when you attend to the great dilatation of the vessels, which belong thereto. For Bogdanus saw, very plainly, the internal epigastric veins, and their "extremities, to have tubercles like a filbert, as "if they had been papillæ, and even notch'd;" and Knifelius (*t*) "the veins: "very much extended, and terminating in globules." And the same dilatation, beside the history of Mothius given above (*u*), is prov'd from what Palsin (*x*) asserts of the mammary, and hypogastric veins (though perhaps he meant to say epigastric) being enlarg'd to the thickness of the little finger. And how much the blood-vessels, betwixt the peritonæum, and the abdominal muscles, may dilate themselves, nothing more clearly shows, than the circumstance related by Anthony de Pozzis (*y*), of very black blood being found betwixt them, to the quantity of eighty pounds, in a plethoric and, at the same time, dropsical virgin.

57. These fountains, or origins of the fluid, being thus added, and explain'd, there will be less reason to wonder at the vast quantity of water, which has been found, by many persons, in a drop of the peritonæum: the greatest quantity of which I do not mention here, as I am afraid of being led into some error, by the measures being different among different nations.

- (*a*) N. 49.
 (*b*) (*c*) N. 47.
 (*d*) N. 49.
 (*e*) N. 50.
 (*f*) N. 49.
 (*g*) (*gg*) N. 50.
 (*h*) N. 51. 52.

- (*i*) Resp. ad epist. de recent. medic. ff.
 (*k*) (*l*) (*m*) (*n*) (*o*) (*p*) (*q*) Cit. ad n. 50.
 (*r*) (*s*) Ad n. 49.
 (*t*) Ad n. 50.
 (*u*) Ad n. 49.
 (*x*) Ad. n. 50.
 (*y*) Eph. n. c. dec. 1. a. 4. obs. 41.

But the dispositions of the discerning organs, in consequence of their being preternaturally affected, join'd with the various constitution of the blood, will diminish our admiration, when we read that a different kind of humour, or fluid, was found in different cases, instead of a limpid, or fluid serum; so that even in some, as by Gahrlepius (*z*), and Camerarius the son (*a*), it was found to be like jelly, or gluten: or if in some it has been found less deprav'd, yet in others, humours of the most vitiated kind have been found, and ichor proper to produce ulcerations, or even to consume the very parts themselves; if, however, in the woman spoken of by Acholzius (*b*), the muscles of the abdomen were really almost annihilated, and not rather chang'd into any other form, or extenuated by their emaciated state, as in the case given by Nuck (*c*); or even by too great distention, as in the relation of Gahrlepius (*d*), and, as it in part seems to have been, in the observation of Littre (*e*).

58. To these things that I have cursorily hinted, in regard to the causes, and nature, of this disease, it will not be improper to add something in regard to the signs. You will know it from the alcites by these marks: first, because it increases, for the most part, more slowly than that, and particularly in the beginning, as almost all the examples show; among which I know not why some have here had an eye to the observation of Blasius (*f*), wherein not a word is said of the time: and I said, for the most part, that I may not seem to you to be in an error, if you should suppose that the histories of Nuck (*g*) and Chomel (*h*) belong to this class; the first of whom saw the tumour of the belly increas'd to a very great size, "in the space of a month," and the latter even in a much shorter time.

In the second place, the face, in the disease I am treating of, continues to have its natural colour; as the observations of Drelincourt (*i*), and Littre (*k*), teach us, and one of Chomel's (*l*) seems to hint: and, indeed, Nuck (*m*) first expressly advanc'd this, as one of the signs; although I see that a virgin had been formerly describ'd by Dodonæus (*n*), who, through the whole time that she was troubled with a tumour of the abdomen, "had a continually elegant and lively colour of her face, just as in health;" yet the tumour was from urine, which the bladder, being pierc'd through with ulcers, had pour'd out into the cavity of the belly.

In the third place, the strength, and action of the body, agree with the complexion, as is testified by the same Nuck, and prov'd by examples; not only those three which I just now spoke of, but also by many others, and, in particular, by that of Meekrenius (*o*), who remark'd an almost incredible agility with that weight, and even utero-gestation, and regular child-birth; which are related by Laubius (*p*), so that the infant liv'd: and the woman spoken of by Scultetus (*q*), bore a child three times, and "always with a proper evacuation."

(*z*) Cit. ad. n. 50.

(*a*) Ad n. 54.

(*b*) Ad n. 47.

(*c*) (*d*) (*e*) Ad n. 50.

(*f*) Ad. n. 49.

(*g*) (*h*) Ad n. 50.

(*i*) (*k*) (*l*) (*m*) Ibid.

(*n*) Medicinal. obs. c. 34.

(*o*) Cit. ad n. 49.

(*p*) (*q*) Cit. ad n. 50.

The observation of the menstrual evacuations being duly preserv'd was still more frequent, as in those three authors whom I quoted in the first place, in regard to colour: to whom you may add Camerarius the father (*r*), and Schrockius (*s*); but others have either fallen into this dropsy, after that purgation has ceas'd from age, or, which is more frequent, after its being suppress'd, or not properly regulated: so that married women have thought themselves pregnant, and virgins have had their reputation suspected. As to thirst, and the quantity of urine discharg'd, although I read of the woman describ'd by Nuck (*t*), "that notwithstanding she was troubled with a thirst, and drank a great quantity of liquids, for the most part, she made "nevertheless but little water;" yet in others, I either observe nothing at all to be said about it, or it is said, in general, that the patient had liv'd pretty comfortably, or, at least, without any particular uneasiness, that great load of belly excepted; or it is even expressly said, "that the urine had continu'd unchang'd at the time of its discharge, in its consistence, colour, and "sediment," as by Drelincurt (*u*); and in the second observation of Chomel, that the matron had no thirst, and discharg'd her urine naturally as usual: and I see, besides, that in the woman spoken of by Nuck, the urine was "somewhat pale," and not saturated, as it is in those who have an ascites; but that a small quantity of this discharge, and a thirst, have been remark'd in the disease, after having made a considerable progress, and being complicated with other disorders, particularly with calculi of the kidneys.

For when the disease has continu'd a long time; and it may be carried on to a very great length, even to the space of many years (which is a circumstance, of itself, sufficient to distinguish this disorder from the ascites) and not only to the space of four years, as Littre (*x*), and others, to six or seven as Laubius (*y*), to eight as Bogdanus (*z*) and Knifelius (*a*), to nine as Scultetus (*b*), to ten as Nuck (*c*), and others, have seen it; but it is even certain, as is shown above (*d*), that it may be born for more years than these: when the disease, therefore, has continu'd a long time, it is not to be expected that the greater part of the good symptoms should remain. But it is sufficient that there have been most of these good signs, in order to distinguish the one from the other: which is also true of the other symptoms that I am going to add.

For, in the fourth place, there was no swelling of the feet, except in the case of Gahrlepius (*e*), in the beginning of the disease; none, except near the close of it, and not even then in all: no wasting of the other parts, and of the body in general; no difficulty of breathing; no slight fever; no pain. Yet when the disease is far advanc'd, all these symptoms are, for the most part, accusom'd to come on; and especially if with the water there are internal tumours, which come to suppuration, and the sac becomes ulcerated: although we have the description of an highly emaciated state of body coming on, even without these suppurations, from Drelincurt (*f*); and of a conti-

(*r*) (*s*) (*t*) (*u*) Ad n. 50.

(*x*) (*y*) Ibid.

(*z*) Ad n. 49.

(*a*) (*b*) (*c*) Ad n. 50.

(*d*) N. 56.

(*e*) Cit. ad n. 50.

(*f*) Ad n. 49.

nual, and intolerable pain, particularly in the night-time, from Achiol-
sius (*g*).

In the fifth place, medicines are of no advantage : and whether you strive to increase the discharges by the bladder, or intestines, the tumour of the belly is not diminish'd ; but the strength of the patient is rather diminish'd, especially if any violent remedy be made use of ; and her miseries are encreas'd : so that I do not remember to have read an instance of any one, who has been in the least reliev'd, for any short time, in this dropsy (which is a circumstance that happens frequently in an ascites) not to say that has ever been perfectly cur'd.

59. But although these signs may be of use to distinguish those dropsies one from the other, yet I do not know of how much advantage they may be in distinguishing this of which I am treating, from another peculiar kind of dropsy. For I have observ'd that the same Nuck, when he proposes the greater part of the signs which I have enumerated ; so that if they are still good, the water may be drawn off from the peritonæum ; does not seem very well to have remember'd what he had asserted in the chapter preceding (*b*). I, says he, " have learn'd, by experience, that those women whose face is of " an agreeable rosy colour, who have a pretty good appetite for food, drink, " go to stool, and make water without any considerable uneasiness, whose " bodies are not much affected by purgatives, by diuretics, nor by diapho- " retics ; I have learn'd, I say, that these women generally labour under a " dropsical disorder of the uterus, the Falloppian tubes, or the ovaries ; and " that the lymph which is included in a peculiar sac, can be carried off by no " art:" by which he understands surgery as well as medicine. And as to the other signs which he has not touch'd upon, you easily see, by the light of reason itself, that these, also, may be common to the dropsy of these parts, and of the peritonæum.

Let us see, therefore, what the remaining signs of the dropsy of the peritonæum are. For they are those which are taken from the inspection of the abdomen, and the examination thereof with the hand. And that certainly would have been the most easy, and natural, which I remember to read propos'd by a certain very famous man ; I mean, that in this dropsy there is always the smallest prominence about the navel : because in that part the peritonæum cannot be separated from the tendons of the muscles. But the case seems to have been quite different, as it appear'd to Hoechstetter (*i*), to Drelincurt (*k*), and to Nuck (*l*), the first of whom saw the navel, in this disease, " expanded, and altogether dilated ;" the second " projecting ;" the third " prominent," to such a degree, as considerably to exceed the size of a " fist." And what will you say to this, that a countrywoman describ'd by the celebrated Brehmius (*m*), had not only her navel prominent to the size of a goose's egg ; but even that the tumour, being spontaneously ruptur'd, always pour'd out, on every other day, such a quantity of limpid and inodo-

(*g*) Ad n. 47.

(*b*) 8. Adenogr.

(*i*) Cit. ad. n. 47.

(*k*)

(*l*) Ad n. 50.

(*m*) Act. n. c. tom. 8. obs. 79.

rous serum, that the large tumour of the belly being entirely got rid of, the patient recover'd.

But, as it only seems "most probable" to the author, that this was a dropsy of the peritonæum, it is proper that I produce a more certain example, and one that is confirm'd by anatomy, as I generally do, and that from the celebrated Anhornius (*n*). A young man, who was the more readily suppos'd to be troubled with an ascites, because he had, more than once before, labour'd under an anasarca, having his navel grown out to the bigness of a fist, and in consequence thereof, spontaneously ruptur'd, had a great quantity of serum discharg'd from the fissure, so that health seem'd to be restor'd; but after two months, the navel started out again, with a fresh-collected fluid, which was a second time discharg'd: finally, a third time the tumour, which had twice vanish'd, distended the abdomen; but as he was now become tabid, the fluid, which was again discharg'd in the same manner, was of no effect in preventing the fatal period of the disease.

By dissection, no serum was discover'd in the cavity of the belly, but whatever of this fluid remain'd was found "betwixt the duplicature of the peritonæum;" where the fountains, or origins of it, that is to say, "many lymphatic tubuli, or little glandular knots, which, when press'd, wept a limpid water," were also found. And these things I have related the more at large for this reason, because this is the only example of the dropsy of the peritonæum, which I have hitherto been able to meet with in the male sex. For as to your being, perhaps, ready to suppose, on reading the case of a great man (*o*), whose belly swell'd in the decline of a fever, which had been join'd with a grievous colic, and decreas'd in its size, by reason of the navel, which had been a long-time prominent, being spontaneously ruptur'd, and pouring out "thirty pints and more of true and very foetid pus," and afterwards a considerable quantity also; a fistula of the navel remaining behind, with two scirrhus glands, as it were, at the side thereof; as to your being ready to suspect then, that this case ought to be referr'd to the class of dropsies of the peritonæum, I would have you first consider, how different from your suspicion, was the opinion of the physician who was far the most skilful, although he propos'd the matter by way of *problem*; and in the second place, that although the morbid matter was translated into the same situation, wherein that dropsy is generated, or, if you please, collected there, yet that this was not serum by any means, but real and true pus.

And I have not presum'd even to enumerate the singular observation of Gabbriliellius (*p*) on a woman, among the examples of dropsies of the peritonæum, notwithstanding he found that the almost incredible quantity of water, had not been in the cavity of the belly, but "betwixt the peritonæum and the muscles." For that water did not seem to me to have been secreted there, which could be carried off in the space of three days, by the use of some hydragogue medicines, in so great a quantity, that the vast tumour of the belly quite subsided, which I have said above (*q*) does not happen in this species of dropsy. And indeed as this woman had her dropsy come on after

(*n*) Eph. n. c. cent. 9. obs. 100. n. 2.

(*p*) Eph. n. c. dec. 3. a. 5 & 6. obs. 279.

(*o*) Commerc. litter. a. 1735. hebdom. 37. n. 2.

(*q*) N. 58. in fin.

an inflammation of the spleen, that viscus was found to be the only one which was diseas'd; "some ulcerous sinusses" therein, by means of membranes that lay between, "constituting a kind of small canal; whereby a serosity" was transmitted from the spleen, betwixt the peritonæum, and the muscles "of the abdomen."

But, to return to the sign taken from the navel, and the part which lies nearest to it round about, subsiding; I should, rather, in conjunction with Respingerus (*r*), whom I have already quoted, and whose observation, also, is an argument against this sign; I should rather, I say, believe, that some particular cases had been consider'd, in which either the disorder was not yet far advanc'd, or, at least, wherein there was but a small quantity of water. From whence you may gather, that if those objections, which were just now made to this sign, could not be of any force, yet that it would be of no advantage, when the dropfy of the peritonæum did not extend itself to the region of the navel; and, in like manner, of no use at that time, in order to distinguish those other included dropsies (as they are by no means seated betwixt the muscles, and the peritonæum) from this of which I am speaking. And I fear the same thing of other signs of the same disease, which are propos'd by men, in other respects, very learned. They are these.

If the belly preserves nearly the same figure, although the situation of the body be chang'd. If the tumour has any peculiar circumscription. If there be any place of the belly, wherein if it be struck on one side, no stroke, no fluctuation are perceiv'd on the opposite side. But to begin with the last, and to take no notice that Nuck (*s*) has plac'd among the signs, or, at least, among the good signs of this disease, "if the patient feels scarcely any fluctuation." Hoechstetter (*t*) has remark'd of his patient, in the latter part of his Scholium, that the great tumour of the belly, when stricken with the hand, gave forth a sound like a drum; but that "a fluctuation of water" had been "never" perceiv'd: and Camerarius the father (*u*) has said, that not even in the body of a woman after death, that is when we are at liberty to handle the belly more freely, and to strike it with more force, did it seem to contain any thing fluid, rather than solid; or, in other words, "no fluctuation was perceiv'd." This third sign, therefore, will be of no advantage, except where we can observe a fluctuation. And the second, which is taken from the peculiar circumscription of the tumour, will not be of any advantage, when this dropfy shall distend the whole abdomen to such a degree, that "the belly is pretty equally tumid, as the same Camerarius observes; or as Drelincurt saw (*x*) it, "equal, not acuminated, or tending to a point, in "any part, or protuberating here and there with little risings."

But, when the tumour shall appear to be bounded within a certain region, it will not, for that reason, be altogether plain, whether this tumour is from a dropfy; or, if from a dropfy, whether from a dropfy of the peritonæum, or of those parts, of which Nuck said it was, when the tumour occupied the

(*r*) (*s*) Cit. ad n. 50.

(*t*) Ad n. 47.

(*u*) (*x*) Ad n. 50.

lower region of the belly: although how high, and to how great a breadth, the dropſy of one tube may extend itſelf ſometimes, that obſervation of Munnickius, which is publiſh'd in the *Bibliotheca Anatomica* (y), ſufficiently ſhows.

Laſt of all, in regard to that firſt ſign, it will be, perhaps, of uſe, when the water confin'd in the peritonæum, ſhall be as yet in very ſmall quantity. But when it has increas'd to ſuch a degree, that the belly, as you ſee in the plate of Meekrenius (z), hangs down to the middle of the thighs, or almoſt to the knees, as Helwigius (a) deſcribes it; and even, on one hand, covers the whole breaſt, and, on the other, the legs, as Paſſin repreſents (b); it is then certainly not to be ſuppos'd, that the figure of the belly is not chang'd, if the ſituation of the body is chang'd. And as to the other ſigns which are added, and are to be collect'd, after the water is drawn off by the ſurgeon, by the probe, by examining the parts with the hand, and by injection; beſides their being too late, they are alſo of ſuch a nature, that they may indeed ſerve to diſtinguiſh this diſeaſe from the aſcites, but not from thoſe other kinds of dropſy.

60. Be cautious, however, of ſuppoſing that theſe ſigns, which I have hitherto examin'd, are diſapprov'd by me. For I have only excepted the caſes in which moſt of them may be of no effect. But it can ſcarcely happen, that all of them are uſeleſs in moſt caſes; eſpecially if we attend cloſely to the firſt beginnings of the diſeaſe, and accurately conſider what was the face of affairs at that time: as, for inſtance, if the tumour ſhall begin from the epigaſtrium; or if from the hypogaſtrium, ſhall nevertheless be immoveable while the woman lies down, and turns herſelf from one ſide to the other, nor ſhall give any ſenſe of internal weight at the pubes, when ſhe ſtands upright, nor cauſe any difficulty in making water: although when the diſeaſe is advanc'd, there may be marks, from whence we may judge certain parts, ſay the uterus, for inſtance, not to be affected; that is to ſay, if the menſes continue to be properly diſcharg'd, we may conjecture that this viſcus, the tubes, and the ovaria, are not oppreſs'd with a dropſical, or other kind of tumour: or if the woman feel none of thoſe ſymptoms which I mention'd juſt now. In ſine, the intention, and ingenuity, of thoſe perſons who firſt deliver'd, down to us, the ſigns of diſeaſes, are highly to be commended. Yet, at the ſame time, it is our buſineſs to compare together, a greater number of hiſtories, both of diſeaſes, and diſſections, than they had it in their power to compare; that from thence we may learn which of theſe ſigns may be us'd the moſt ſafely, and when: and, on the contrary, which is leſs to be depended upon, and apt to lead us into error.

61. Thus even in the cure of this dropſy, that is, the dropſy of the peritonæum; in order to ſay ſomething on this head, alſo, as I have promis'd; what could be done by Tulpius (c), and Meekrenius (d), better than to extol the paracenteſis alone, which had been recommended by Walæus and Coſterus, in a living woman, againſt the dropſy of the peritonæum; after having

(y) Tom. 1. in adnot. ad Graaf. de mulier.
organ. ubi de oviduct.

(z) Cit. ad n. 49.

(a) (b) Ad n. 50.

(c) (d) Cit. ad n. 49.

examin'd the nature and seat of this disorder, by dissection. For without doubt, on one hand, they saw that other remedies were of no effect; and, on the other, that this operation might be perform'd with the greatest expedition and safety, as the viscera were entirely separated from the water; and, for that reason, found: from whence there is no doubt but the long preservation of the vigour of the body, together with its capacity for action, is to be accounted for, as I have said already (*e*).

Other physicians, and surgeons, influenc'd by the same kind of reasoning, came into this opinion; Nuck (*f*), in particular, not doubting, but the ruptur'd lymphæducts may be clos'd again, in consequence of their being compress'd, betwixt the muscles of the abdomen, which contract themselves, and the laminæ of the peritonæum; which in an ascites, that has its origin from the rupture of lymphatic vessels, can by no means take place; and producing two cures of the dropsy of the peritonæum, which were brought about in this way, one of Amicus, and the other, which he suppos'd to belong to this class, from Thomas Bartholin: to which he would, moreover, have added others, if they had then existed; as that which the celebrated Degnerus (*g*) has given the history of, where the disorder was in the lower part of the abdomen, on the right side: and still more, that which Brehmius, whom I have already commended (*h*), relates; when the dropsy was in the whole abdomen, and which nature herself perform'd, by a great discharge of clear water in the former case; and, in the latter, by a great discharge of limpid, and inodorous serum.

But after it was observ'd, that the peritonæal sac was not always so dispos'd, as it was seen to be by Tulpius, and Meekrenius, but was, sometimes, so affected with tumours, abscesses, and ulcers, that though the water might indeed be drawn off, the sources of this fluid, nevertheless, and the pus, could not be so easily dried up; and that, for this reason, a matron of whom Littre (*i*), and a woman of whom Laubius speaks (*k*), could not be sav'd, although the former had the water drawn off thirteen times within two years, and the latter sixteen times within ten months; so that the whole quantity of fluid, discharg'd by this last woman, amounted to more than seven hundred and twenty pints: then this method of cure did not seem to be, always, so expeditious, and secure, as it had at first seem'd; nor was it without reason, and justice, that they chang'd their opinion. And that this will appear the more reasonable to you, I do not doubt, as there are so many of the observations I have produc'd above; and those even from former times, wherein these disorders of the peritonæum were not wanting.

Therefore, besides those women, whose strength is already broken down, who were the only subjects excepted by Tulpius, and those whom Nuck had excluded afterwards, for various reasons, indeed, but all referable to the same head nearly; Littre has moreover prudently added others, admonishing us with how much danger of an unsuccessful event, we undertake the cure of those women, in whom not only the disease is very inveterate, and very much

(*e*) N. 58.

(*f*) Cit. ad n. 50.

(*g*) Act. n. c. tom. 5. obs. 2.

(*h*) Vid. supra. n. 59.

(*i*) (*k*) Cit. ad. n. 50.

extended, but those also in whom the water which is drawn off is thick, of a bad smell, and a deprav'd colour; and in whom any tumour, or hardness, that is when the water is evacuated, is perceiv'd in any part of the peritonæal sac. And this sign was afterwards manifest in the woman of Laubius, and another also, which ought to be added here; I mean that the right side being prick'd, nothing but pus was discharg'd, while from the other, which was prick'd at the same time, water flow'd out. However, these two last mention'd signs relate to fore-knowing the event of the case, when the cure has been already undertaken, and not to the propriety of attempting it.

62. But before you even undertake to attempt a cure, I would have you enquire, accurately, whether there was any hardness, or tumour, before, which the great distention of the abdomen now hides; and besides, whether the patient is troubled with any considerable pain (I do not mean that which the distention itself produces, but that which arises from an ulcerous erosion of the testis) or, at least, whether pain is excited in any part of the abdomen, when you press it pretty closely with your fingers. It does not, however, escape me, how happily every thing succeeded with Chomel (*l*), even in a great suppuration, and a certain erosion; but both of them recent: nor what Litter (*m*) proposes against these ulcers, first by injections, and after that by skilful compressions, and bandages; and even against tumours, by cutting into them from above, and applying certain methods of cure. I know, also, that the water was drawn off by Laubius (*n*), not with a view of curing, but of easing the patient, where there were purulent tumours.

But I am not speaking, here, of prosecuting cures which are begun by nature, or by art, but of attempting them at large; and without a proper hope of bringing them to perfection. You, therefore, will avoid those patients, also, which I just now added, when it is in your power. Yet there are, besides, those in whom the tumours are not altogether hid by the distention of the abdomen; either because there is as yet a less quantity of water, as in the second of the observations that I have produc'd (*o*); or even because the water, or any other matter of a thicker nature, is not contain'd in one continu'd sac, but is divided into many cavities; so that some are more turgid, and others less so: such as were found in the dissection of a midwife after death, by Camerarius the younger (*p*), who very prudently objected to performing the operation of paracentesis, which had been recommended by another; because he had observ'd “the bulk of the abdominal tumour to be unequal, and to “give a different degree of resistance in different regions.” And what could the paracentesis have done in this case, or even in that which Gahrli-epius (*q*) had describ'd?

For the matter, whether similar to gluten, or to the spawn of frogs, does not evacuate itself by the infliction of a pretty large wound; not to say by the usual foramen: and if it be thin, even very thin, where it is separated by many partitions, as it was in both of those observations, although it should be discharg'd from one cavity, which you have perforated, it does not, for that reason, come out of the others; and therefore the same thing must of

(*l*) (*m*) (*n*) Ad n. 50.

(*o*) N. 52.

(*p*) Aët. n. c. tom. 1. obs. 160.

(*q*) Cit. ad n. 50.

course happen here, that I said happens in an ascites (*r*), when that is made up of hydatids, which are, also, connected with each other. And as I see that this case is reckon'd among the various kinds of ascites, I was not willing to pass over this "encysted dropfy," as it is call'd by observators, on the present occasion. For although it differs in its matter, and in its partitions, from the more frequent dropfy of the peritonæum, yet it is generated in this membrane: nor ought we to omit the mention of it, because it is only a rare case, but rather take particular notice of it, for that reason; lest when it is at any time met with, it should be again improperly confounded with the ascites, or with the other more known dropfy of the peritonæum.

63. And indeed I cannot help thinking it very proper to take notice of other dropfies, that are encysted in like manner, before I make an end of writing. There are some thus call'd by those who give the histories of them, which, nevertheless, belong to the more frequent dropfy of the peritonæum; as that on which the celebrated Schefflerus (*s*) publish'd a dissertation, in which he is of the same opinion with me (*t*); I mean that a great quantity of serum had been collected "within the duplicature of the peritonæum," and had, by this means, form'd a sac, upon which a large steatoma was generated. But others are of a different kind, as that describ'd by the celebrated Anhornius (*u*); an almost incredible quantity of fluid being confin'd betwixt the peritonæum, and the omentum, which was become very hard, in a woman whose "face, considering her emaciated state of body, was of a pretty good colour, "and whose feet free from swelling:" which kind of signs, and others likewise, I shall not omit to mention from time to time, that you may compare them with my former doubts and hesitations (*x*).

So, also, the younger du Verney (*y*) relates, that a woman, of thirty years of age; who had begun to have a tumour in her belly seven years before, was of a good complexion, had a good appetite, and slept well, and was as yet very ready and alert in her actions; had, on opening the abdomen after death, a large sac therein containing many cells, not at all communicating one with the other, each of which was filled with a peculiar matter, quite different from the rest: which agrees very well with his account, that a serum of a different nature had been drawn off at different times. And the same author dissected a woman with an ascites, in whose belly he found, besides, a large cyst full of redish serum. There are also encysted dropfies, in regard to which it does not well appear, from the anatomical description, whether they belong to the first or second class; as you will easily believe, from reading what is written of the sac, which was seen in a certain virgin (*z*), who had been taken off by a very sudden death, after the discharge of the water.

64. And although I shall write some things, in the next letter upon the dropfy of the ovaria; yet, as this, also, is enumerated among the encysted dropfies, I will rather here hint at such remarks, as you may readily join

(*r*) N. 45.

(*s*) Hist. hydr. saccat.

(*t*) §. 4.

(*u*) Eph. n. c. cent. 9. obs. 100. n. 7.

(*x*) N. 57.

(*y*) Mem. de l'acad. r. des sc. a. 1703.

(*z*) Eph. n. c. cent. 7. obs. 17.

with those which I had occasion to make before (*a*), upon the same disease: lest in the next letter I should be more prolix, or less clear, than is necessary.

Some observations of this disorder, likewise, are certain, and others doubtful. I will produce examples of each kind, which you may add to the Sepulchretum. Among the certain observations of this disorder, either in its beginning, or when it had made but little progress, are those made by Camerarius the son (*b*), by Goetzius (*c*), by Maggi and Dodi (*d*). The first of these gentlemen found a humour in the ovarium, to the quantity of four ounces; the second to the quantity of three pints; and the two last to the quantity of three pints and a half: and the same observers (for the two first had heard nothing of the signs relating to the disorder that they could remark) found out, by inquiry, that the woman had often complain'd of a weight, which she perceiv'd in the lower part of her belly, in such a manner, that on whichever side she lay, on that side the weight lay; and when she turn'd herself to the opposite side, the weight was transfer'd thither likewise.

But those of whom Riedlinus (*e*), Vacher (*f*), and Schacherus (*g*), have written, after that in each of them the ovarium, and the belly, had already grown out into a surprizing tumour, gave these relations nevertheless; the first of them, that her belly had begun to swell on the left side; at which time she had conceiv'd, notwithstanding this affection, and was happily deliver'd, being alert, sprightly, and robust, even in the latter part of her disease; inasmuch as, except the tumour of her belly, which was troublesome to her, she had nothing that gave her the least uneasiness: the second, that six or seven years before, she had first of all felt a pain in the hypogastrium, on the left side: the third, that some years before, a pain in the belly, which she did not know how to explain, had been the beginning of her evils; that after this, a tumour being form'd by degrees, the weight of it was us'd to fall on that side, to which the situation of the body inclin'd it.

These two, as well as the first, had found no advantage, or alleviation, from medicines of any kind whatever: but they had not, like the first, suffer'd very little inconvenience, particularly in the latter part of the disease, when they were unable to rest in their beds, except they supported themselves on their bended knees, and, inclining their bodies forwards, laid their heads upon the bed that was under them: which kind of posture was observ'd by Schefflerus (*b*), to be necessary, in some measure, to the woman he spoke of, in order to incline her to sleep: but this woman labour'd under a dropsy of the peritonæum; and the three, of whom I am at present speaking, under a dropsy of the left ovarium; which being ruptur'd, here and there, in the third woman, had join'd an ascites to itself over and above, just as it happen'd in that widow who is describ'd by the celebrated Bassius (*i*), and in another woman, who is spoken of by the celebrated Guttermann (*k*).

(*a*) N. 58. 59.

(*b*) In obs. 160. cit. supra ad n. 62.

(*c*) Act. n. c. tom. 2. obs. 207.

(*d*) Apud Vallisner. istor. della generaz.

P. 3. c. 5. & tab. 12.

(*e*) Eph. n. c. cent. 7. obs. 56.

(*f*) Hist. de l'acad. r. des sc. a. 1739. obs. anat. 3.

(*g*) Diff. de virgine ascitica §. 10. 13. & cat.

(*h*) Cit. n. 63.

(*i*) Dec. 4. obs. anat. 8.

(*k*) Act. n. c. tom. 3. obs. 105.

Others have been more happy under this tumour of the ovarium, though increas'd to the highest degree; as the virgin of whom Gullmann (*l*) relates that she had, nevertheless, for fifteen years, "enjoy'd perfect health; for her "menfes were regular; "she had a good appetite, slept well, &c;" except that, in the two last years, she was frequently seiz'd with swoonings: and, in like manner, as two women who were dissected by Jo. David Mauchartus (*m*). In what state these patients were, for more than seven years, during which time, if you except almost the last weeks, they were never under a necessity of confining themselves to their beds, you may conjecture from the words which he premises to the observation: those dropfical women who "are neither pale, but rather preserve a rosy colour in their cheeks, nor have "a tumour of the feet, so that they rather grow lean, and slender, in their "limbs, and the other part of their body, notwithstanding the abdomen is "increas'd every day; these women, I say, if they carry this load about "them for a long time, without any considerable injury to the actions of "the body; if they have a good appetite, are not very thirsty, nor have a "cough, but the intestines perform their office properly, the urine is of a natural colour, and the tumour of the abdomen neither gives way to purging "nor diuretic medicines; and especially if the disorder takes its origin from "a difficult birth, or an unfortunate time of child-bearing, from a false conception, or abortion, without other concurring signs of a cachexy; are "always affected with a dropsy of the ovarium, or that which is call'd an "encysted dropsy."

But these words of this very eminent man, if we understand them so as to suppose them referable to no other dropsy but that of the ovarium, are contradictory, you see, to those things which are shown above (*n*), in regard to some other patients, and will be shown below. Moreover, as to the signs of that dropsy, the celebrated Trew (*o*), when he proposes his observation thereof, says there were, among those that examin'd the abdomen of a living woman, some who "pronounc'd that there was an encysted dropsy;" and others who, "because no fluctuation could evidently be perceiv'd, upon "striking the belly, call'd it into question:" and then enquires, "whether "when the abdomen is expanded into a preternatural bulk, is, at the same "time, ponderous and heavy, but a fluctuation cannot be very accurately "perceiv'd, by a percussion of the belly;" he inquires, I say, "whether "we may reasonably conclude from thence, that the disease ought to be "call'd a dropsy of the ovarium, rather than an ascites?" The celebrated Targioni (*p*) however; who saw a very great dropsy of the ovarium, if any other man did, and has written accurately, and learnedly, upon this disease; when he gives the history of a matron, who was afflicted with this disorder four and thirty years, from the beginning to the end, being troubled with an excessive discharge of the menstua, as long as her time of life permitted; and, finally, with frequent vomitings, and some difficulty of breathing, in going up stairs, and being extenuated in the upper part of her body, but

(*l*) Eorund. t. 2. obs. 80.

(*m*) Eph. n. c. cent. 8. obs. 14.

(*n*) N. 58. 59.

(*o*) Comerc. litter. a. 1734. hebd. 44.

(*p*) Prima raccolt. d'observ. med.

having a good appetite, and being able to stand, even to the very last week of her life, and to move herself as she pleas'd; and, what is still more surprizing, to lie down on either side, or in a supine posture, and with her head low, without any inconvenience; relates that the same woman, both while she was living, and after death, was known to have her belly full of water by the touch: as a fluctuation was very evidently perceiv'd, even by striking it gently with one hand, while the other was applied to the opposite side, just as it happens in patients who have an ascites.

Nevertheless, the sac fill'd the whole cavity of the belly: and the water, which was computed to be in the quantity of about a hundred and fifty pints, fill'd the whole cavity of the sac to such a degree, that upon making the slightest puncture into it with the knife, the fluid burst forth with the greatest impetus. Is this difference to be accounted for from hence, that in the woman spoken of by Trew, the water was divided into many cells; but, in the matron spoken of by Targioni, was contain'd in one cavity, so that nothing prevented the fluctuation being communicated? I should perhaps have made this conclusion, and not without some advantage in the cure of the disorder, as will be shown hereafter (*g*), if Camerarius the father, when he could perceive no fluctuation, as is said above (*r*), had made any mention of cells being found in his large sac. You will inquire more accurately into these things, not only in the writings of the authors whom I have mention'd by name, but also in the writings of those whom I have without doubt omitted (*s*); among whom the celebrated Benevolus (*t*) ought to have been particularly consulted by you, if he could have describ'd the other circumstances, with the same accuracy, wherewith he describ'd that large sac, into which the ovarium had expanded itself.

65. Hitherto I have taken notice of those observations, which are, beyond a doubt, to be refer'd to the dropsy of the ovarium. I will now subjoin some, according to my promise, in regard to which you may be in doubt, whether to class them with the others. You will read two of the celebrated Jo. Mart. Brehmius (*u*), in the first of which a great sac, full of water, that the patient had been troubled with for fourteen years, was "very closely connected" to the urinary bladder; and in the second a sac of the same kind which had troubled the woman for two years "was grown into one substance with the fundus uteri, towards the left side; where it seem'd to have taken its origin, by the means of various ducts and canals." As no mention is made of the ovaries, or tubes, no more than in a certain history which was publish'd five and thirty years ago, in the two cities next to this, as if of a dropsy included in the uterus, whereas the uterus did not contain the water, as it ought to have done; and as you may see, in particular, in the observation of Henricus Alb. Nicolai (*x*), wherein a large cyst, distended with water, rais'd itself up from the left side of the fundus uteri, quite to the diaphragm; I lie under a necessity of doubting in this case, although I am not ignorant that Riedlinus (*y*) has, with good reason, suppos'd "a dropsy

(*g*) N. 70.

(*r*) N. 59.

(*s*) Vid. epist. 65. n. 17.

(*t*) Offervaz. 9.

(*u*) Aët. n. c. tom. 6. obf. 94.

(*x*) Dec. obf. illustr. anat. obf. 9.

(*y*) Obf. 56. cit. ad n. 64.

“ which is said to be uterine, to have its origin and seat, for the most part, in the testes ; from whence those sacs, which are frequently so large, and contain so large a quantity of water, and cover all the intestines . . . are deriv’d.”

But the younger du Verney (z) found two large cysts of that kind, rising from the left side of the uterus, and embracing the ovary ; but, in one of the women, not dilated, as he says, and shut up within another cyst of a larger size : in the other, dilated, but not at all in proportion to the magnitude of the cyst in which it was comprehended. I should, perhaps, have conjectur’d that the external coat of the ovaries, expanded by water, had made these large cysts, if he had not said that they rose from the side of the uterus.

66. There are, also, instances of a dropsy that relates to the tuba Fallopii ; some of them, like the former, certain, and others doubtful. In the number of the certain ones I reckon that which was sent from Munnickius, and publish’d by the compilers of the *Bibliotheca Anatomica* (a). For it is sufficient to look at the figure, in order to be convinc’d that the right Fallopian tube had dilated itself, so as to contain a hundred and twelve pints of water, under which disease the unhappy virgin labour’d eighteen years. Nearly equal to this, was that dropsy of the tubes which Siboldus has describ’d ; but that describ’d by Cyprianus still larger, as far as I can judge from the *Acta Eruditorum Lipsiensia* (b) ; for neither of these authors was in my hands when I wrote these things. Nor do I doubt but the dropsy of the cornua uteri was really in the tubes, when I examine the figure given by Tulpus (c), who describes it ; which, as well as that of Munnickius, and others also, is wanting in the Sepulchretum. And I wish, with all my heart, that Sponius, whose observation I have quoted above (d), had join’d a delineation therewith ; for he would, by that means, have taken away a scruple from me, which a description cannot remove.

He looks upon his sac as a dilatation of the tube, and he describes the tube as embracing the ovarium, and carried upwards from thence, “ to the extent of half a foot higher than the natural situation thereof requir’d ;” as the sac reach’d quite to the ensiform cartilage. But the tube is generally produc’d, on the surface of the sac, beyond its natural extent ; not when the tube itself, but when some other neighbouring part, as, for instance, the ovarium, is dropfical : as du Verney (e), and Targioni (f), have sufficiently seen ; and as Schacherus (g), and Maggi and Dodi (h) have even delineated. Therefore, since Sponius does not at all represent the ovarium as being dropfical ; and complains that the incautious surgeon, by a hasty dissection, had cut into the peritonæum, together with the muscles ; I suppos’d that this dropsy might be number’d among the other examples of a dropsy of the peritonæum (i).

But if it seem otherwise to you, and you choose to take away this, or any other example, from thence, which I have no objection to your doing, a sufficient number will still remain there. But to what class shall I refer the

(z) Mem. de l’Acad. R. des sc. a. 1703.

(a) Cit. supra ad n. 59.

(b) A. 1085. m. April & a. 1701. m. Febr.

(c) Obs. med. l. 4. c. 45.

(d) N. 50.

(e) (f) (g) (h) Cit. supra ad n. 64.

(i) N. 50.

observation of Rolfinc (*k*), who found the left ligament of the uterus distended with water, to such a degree, “in the upper part,” as to “occupy “the whole cavity” of the belly? Can we suppose that one so well skill’d in anatomy as he was, if he had seen a dilatation of the ovarium which was annex’d to this ligament, or of the tube, would not have taken notice of it? Or shall we take for granted, that there is a peculiar dropfy of this ligament, owing to water being collected betwixt its two membranes, besides the other dropfies in the parts that lie near thereto? This appearance he saw in a woman, who, notwithstanding her abdomen had grown out into a great bulk, and she had been without any menftrual difcharges, for the whole fpace of three years, had, nevertheless, a good appetite, and went about her household affairs as usual, though with some difficulty, till she was carried off suddenly; as another woman, spoken of by Brehmius, was also (*l*); who, however, had her heart increas’d very much in its size; and the matron mention’d by Targioni: for I do not remember, at present, out of all the examples of diseases of this kind, that I have taken notice of, any others besides these three, who have died unexpectedly.

67. Now if you attentively collect, in your mind, the signs that I have mention’d from time to time, as I reckon’d up the observations of almost every one of these dropfies, you will certainly observe, how much they agree one with another, and with the dropfy of the peritonæum; and will understand, that if the great bulk of the belly has already continued a long time (du Verney the younger (*m*) requir’d more than the fpace of two years from the first beginning:) if the tumour has increas’d, by degrees, as in gravid women, without much inconvenience, and without any, or, at least, without a great change of colour in the skin: if purging and diuretic medicines have afforded no alleviation: if the lower limbs have not become tumid, till the latter part of the disease: if there are these signs, I say, you will understand that the woman does not labour under an ascites, but, generally, under some other confin’d dropfy: and yet it does not, of course, follow, that she does not then labour under an encysted dropfy, though any one of these marks may be wanting.

For there have ever been some, who complain’d of internal pains of the belly for instance, that is, in consequence of the viscera, and particularly the intestines, being comprès’d by the neighbouring weight, and distention of the sac; this sac being more fix’d, or prominent, in a certain place; which you easily perceive must happen more frequently, in the dropfy of the ovarium, or any similar part, than in that of the peritonæum. And there may be some, though this is much more extraordinary, to whom the medicines that are administer’d may give a little relief, if they happen to discharge water; not that which is included in the cyst, but that which is extravasated into the cavity of the belly: for that this was, sometimes, the case also, though the water was generally in a small quantity only, has been remark’d by du Verney, whom I have already quoted; and he observes that it happens, at the time when the cyst can admit of no more water: from whence he says

(*k*) Sepulchr. fecit. hæc 21. obs. 61. & 55. (*l*) Cit. supra n: 65.

§. 24.

(*m*) Cit. ibid.

it is, that the lower limbs do not swell, till very late in the disease, as I have already said.

But in regard to the signs, by which you may distinguish the dropsies in question, from each other, you yourself must perceive that there is nothing which you can expect from me; for there is such a propinquity betwixt the ovaria, the tubes, and the ligaments, by which they are connected together, and such a necessity for the functions of them all, in the work of generation, that it is out of our power to gather any certain inferences either from the situation of the tumour, or from the faculty of generation in the woman being impaired, which of these parts is dropsical. And indeed if the woman should conceive, in the mean time, you cannot from thence argue, that these parts are not affected; for you very well know it to be sufficient for this purpose, that they are sound on either side. Yet however, you will naturally suppose that some one of them, and particularly the ovarium, as this is most frequently the part affected, may be swell'd, when the beginning of the tumour shall discover itself in the seat thereof. You will suppose that it may be swell'd, I say; for the tumour may even be there, and yet not seated in these parts.

We must, then, also, consider whether the tumour may not be of another kind; as, for instance, when Gandolphius (*n*) found each ovary equal in magnitude to a man's head, and more than five pounds in weight, but of one and the same compact substance every where; or when he saw the same kind of disorder, in one of the ovaries of another woman, which weigh'd about fifteen pounds: but even tumours of another kind occur, not very rarely, in the same situation, in particular the steatoma (which kind has been found by me (*o*)); and this, as Schacherus (*p*) has admonish'd us, sometimes may be taken for a dropsy of the ovarium. You, however, by diligently weighing all the symptoms that have preceded, and accompany the disease, will more readily suspect the tumour to be of a dropsical kind, when the temperature of the body, the diet, and diseases have been, or are, of such a kind, as to dispose women to dropsies. And by what reasonings you ought rather to suppose the water to be collected betwixt the muscles, and the peritonæum, than within this membrane, I have endeavour'd to show you above (*q*), as far as is possible in disorders of this kind: and if any thing shall occur to my mind, in the mean time, either by reading, or thinking, that may tend to distinguish other dropsies, even by the slightest conjecture, I will not omit it in the next letter (*r*).

68. But if it is difficult to determine the nature of these dropsies, of which I have spoken, it is still more difficult to cure them. Nor would I have you say that nature itself has shown in what way this may be done, when she restor'd to health the woman of whom Brehmius (*s*) writes, by discharging a fluid through a very small foramen, every other day, as I have already said. For that dropsy seems to have been in the peritonæum, as it really was when, according to the relation of Anhornius (*t*), nature attempted the same way three times; and, at first, with advantage, yet afterwards unsuccessfully. But

(*n*) Hist. de l'Acad. R. des sc. a. 1707. obs.
anat. 4.

(*o*) Supra n. 34.

(*p*) Diff. supra ad n. 64. cit. §. 13.

(*q*) N. 60.

(*r*) N. 40.

(*s*) (*t*) Cit. supra ad n. 59.

as I have spoken above of the cure of the dropfy in the peritonæum, I inquire, here, after the method of cure in those dropfies, which are included in a fac or cyft, and contain'd in the cavity of the belly. The younger du Verney (*u*), who was a furgeon as well-experienc'd in the operation of paracentefis as any one whatever, exprefsly denies his having ever feen any one cur'd, who was afflicted with an encyfted dropfy; and, what is more, afferts that he had feen many women, who being troubled with no other difagreeable fymptom, but that of a cumberous belly, and being defirous to get rid thereof, by having the water taken away, had been carried off in a fhort time; whereas they might, otherwife, have liv'd long, and fometimes very long, as the examples frequently pointed out demonftrate. And feveral others have likewife feen that fpeedy death has often been the confequence of paracentefis in thefe difeafes.

Nor is it to be wonder'd at: for nothing more frequently happens, than that the air, being admitted to the water, which is of itfelf, already, of no good nature, as its brown colour, for the moft part, fhow, or to the parts of the fac which are already lax, vitiated, and ulcerous, foon brings on fatal changes. For from hence it chiefly happens, that although, at firft, the patients feem to themfelves, and to others, to have receiv'd much alleviation from the operation, yet inftead of that kind of water which was firft drawn off, and was not of a very deprav'd nature, that which was taken away the fecond, and the third time, or flows out afterwards, may be green, or black, or turbid, fæculent, and fomewhat bloody, or of a very bad fmell; and, finally, not without purulent matter, as you will eafily learn from reading over the obfervation of the furgeon laft-quoted, made on a woman of thirty years of age, and on a virgin of fixty, one of Riedlinus (*x*), and one, and another, of Anhornius (*y*), made upon three women. And what do you fuppose muft happen, when the water is either already, of itfelf, purulent, or fœtid?

Tulpius (*z*) faw nine pints of water, and pus, in the tubes. In the ovarium, Maggi and Dodi (*a*) found a fœtid humour. And what will you fuppose muft be the confequence, when the internal furface of the fac is full of abfcefles, as du Verney found it. Moreover, even though the water may neither be purulent, nor fœtid, and the fac without abfcefles, it certainly has, very often, either hydatids fix'd to it internally, or water, or fome other matter, divided into many leffer facs: from which circumftance it happens, that the water being drawn off from one fide, the fwelling of the abdomen is not remov'd on the other, or the flowing out of it foon ceafes; and if the furgeon then forces on the cannula, he feels an obftacle to its paffage: what is to be done then I would be glad to know? Are all the feparate facs to be open'd? Trew (*b*) found it neceffary to open the membranous interceptions of the leffer facs, "more than ten times," in order to draw out all the water from the larger fac, which contain'd all the others.

But muft we make ufe of the fame method to obtain a cure in the living body, as we do to examine into the diforder after death? Or if it were proper fo to do, would it be in the power of any furgeon to fee the leffer facculi,

(*u*) Cit. ad n. 65.

(*x*) Eph. n. c. cent. 5. obf. 67.

(*y*) Eorund. cent. 9. obf. 100. n. 3 & 4.

(*z*) Cit. ad n. 66.

(*a*) Ad n. 64.

(*b*) Ibid.

which lie hid within the deep cavity of the belly, and pierce through each of them separately, without wounding any intestine, or other neighbouring part, at the same time? Besides, what if there should be innumerable hydatids, as I said there frequently are? What? If all the cells should not contain water, but some a matter like cheefe, or like a pulstice, as in the observation of Miegius (*c*): What? If a large scirrhus were seated there, over and above, such as was seen by du Verney. Other considerations I omit; for from these you already see, with sufficient clearness, why this paracentesis must happen to be not only useless, but even hurtful, to the miserable woman.

69. But suppose even that there is only one sac, and that this sac is not divided by any partitions, as, besides Maggi and Dodi (*d*), Vacher (*e*), Benevolus (*f*), and Targioni (*g*), have found it, and not vitiated with abscesses, and tumours; (for Benevolus observ'd globular bodies prominent inwardly, some of which were even larger than eggs, and Targioni a sarcoma of the bigness of a kidney, which hid small abscesses in itself): finally, suppose that there are no cells, which contain a different kind of matter; and that the water which is contain'd is not of a very deprav'd nature. What follows from hence? Do you think that the case would be then a fair subject for the operation? Targioni says not. As he fears, not only lest the omentum, which is interpos'd, or the intestine, or some other viscus, should be wounded, and lest a part of the water should be pour'd out from the perforated sac, into the cavity of the belly; the latter of which he says may, however, be avoided, if the woman lie in a prone posture; but he is particularly afraid of those consequences, which Schorkopffius (*b*) was formerly afraid of, lest the membrane of the evacuated sac contract a gangrene; or, at least, a supuration; chiefly on account of the air being admitted; or if it does not contract either of these diseases, lest, like other folliculated tumours, it be again fill'd with its proper humour, that is with water.

To me it certainly happen'd that, while I was revising these things, I was consulted by a barren woman; who having had a distention of the abdomen, for a year before, not without a very great resistance, on the left side thereof; and having us'd the assistance of physicians in vain; found, all of a sudden, about the spring of this year, that while she happen'd to laugh, and shake her belly with great vehemence, something burst asunder therein, with a kind of a crack; and it immediately became softer, at the same time that she felt an unusual weight, in the lower part of the abdomen, with a sensation (which had never been before) of fluctuation, and of a certain weight falling down to that side, on which she turn'd herself. And these symptoms having disappear'd, by the help of remedies which discharg'd a great quantity of serum, by the kidneys, and intestines, the woman seem'd, to herself, to be in very good health for fifteen days, but no longer.

For after that time, the abdomen return'd again to its former bulk, and tension; she being of a good colour in her face, as she always was before; her feet not being tumid: and, except certain pains of the belly, which were troublesome at intervals, the large bulk thereof, and the diminution of her

(*c*) Act. n. c. tom. 1. obs. 85.

(*b*) Dissert. de hydr. ovar. th. 25.

(*d*) (*e*) (*f*) (*g*) Cit. ad n. 64.

menstrua, all which circumstances had also been observ'd before, she was agile in her body, robust, and in extreme good health. That the cyst, therefore, after discharging its original fluid, should not be again distended with a fresh one, it would be necessary, if possible, to consume, or extirpate it entirely; as is done in external follicles. But who could propose, or even bear, the first of these operations on a large sac that is hidden among the viscera? The second, indeed, I know has been propos'd by some, who were encourag'd thereto, by that well-known, but very rare, cure of Abr. Cyprianus: yet whether any one has made the trial within these thirty years, or more, since it was propos'd, I cannot determine.

What might be the causes to prevent them, it is not difficult for you to conceive: to omit the greater part of which, if the cyst were always supported by one root alone, on which a ligature might easily be made; as in the observation of Mauchartus (*i*), or in that of Schröckius (*k*); you would, perhaps, begin to give ear to the proposition. But What? If there were more roots than one, or if there was one very broad, and not, as it was with them, "very narrow," or "of the thickness of a man's thumb:" what? If the cyst should be connected to one part, and to another, and even at a great distance from that part of the abdomen, which, in imitation of Cyprianus, you would cut into. Yet this author had learn'd from an ulcer, through which he could feel the carcase of a foetus, which had lain there twelve months, in what part it was to be cut into; just as Degnerus (*l*), if a large dropical tumour, by bursting asunder betwixt the peritonæum, and the muscles, had left not a large, but a narrow passage, could, likewise, very well know, by introducing a probe, which way it might be laid more open with the knife; so that a cyst bigger than an ox's bladder, which came away of itself, might be extirpated by the surgeon.

70. Must we have no hopes then, you will say, of a cure in an internal incysted dropsy, because it is not possible, either to consume, or extirpate, the cyst? The younger du Verney (*m*), nevertheless, hop'd for either a perfect cure, or a great alleviation, if at any time after the water was drawn off, the parietes of the cyst, when collaps'd, should coalesce with each other; and by this means shut up the extremities of the vessels, by which the water was carried thither: and this he suppos'd to have happen'd, in a virgin of twenty years of age, whose belly had begun to swell almost two years before, without any change in the colour of the skin: and, in like manner, in a widow-matron, who, being now advanc'd in age, had been afflicted with a surprizing tumour of the belly for six or seven years: from both of whom having taken away the water, he so perfectly cur'd the first, that she married, and brought forth children; and gave great ease to the other, and long freedom from the disorder, as she perceiv'd nothing of it for more than two years together, till, by degrees, the belly return'd to its former magnitude. But he thought it necessary, that the cyst should be loose, and unconnected, even at that time, as the uterus is in pregnant women; without doubt, fearing, lest, if it was connected here and there, the parietes should be, so much the

(*i*) Cit. ad n. 64.

(*k*) Eph. n. c. dec. 2. a. 8. obs. 233.

(*l*) Cit. supra ad n. 61.

(*m*) Cit. ad n. 65.

more, prevented from approaching one to another, and coalescing. He also thought it necessary, as I suppose, that there should not be more than one cavity in the cyst; which otherwise must be an obstacle to the coalition. But I could wish he had expressly requir'd it: for, perhaps, as he certainly suppos'd, that the cyst might be conceiv'd, by every body, to be unconnected, if it chang'd its situation, in consequence of every change of situation in the body; so he would have shown us from whence we might conjecture that the cyst had but one cavity. It came into my mind, from whence this might be conjectur'd, as I have said above (*n*): but we must inquire still farther into that subject; and into this moreover, how we may know, that the parietes of the cyst are not vitiated with tumours, or abscesses. And he had thought it necessary, in the first place, that there should not be so great a quantity of water, as that the viscera, being forc'd up very high, must be liable to a very great compression, betwixt the cyst, and the diaphragm: but it is surprizing that this never had happen'd in the widow he speaks of. However, it is difficult to find women who are willing to submit to the operation of paracentesis, before they are loaded with a great quantity of water: and, indeed, it generally happens that they do not submit to it, till their strength is greatly impair'd, and their viscera injur'd; or, at least, affected with disease: and then they cry out for any kind of assistance whatever.

Yet there is, you will say, an example of a woman (*o*), who, having, at length, suffer'd the water to be drawn off, when the case was so far advanc'd, that "the skin scarcely adher'd to her bones," was perfectly cur'd by this means; notwithstanding on the first, and the following days, bad signs appear'd; except that a fistula of the belly remain'd: cur'd, I say, so that she conceiv'd, and brought forth children, and liv'd in a corpulent and flourishing state of health some years; till, at length, she was taken off by an epide-mical fever. I shall not say, here, that the woman was young: nor shall I say that while she had a tumour of her belly, a very great difficulty of breathing, a cough, and tumour of the feet, did not attend it. I shall observe this one thing, that these signs are common both to the internal encysted dropsy, and the dropsy of the peritonæum; and that it does not certainly appear, from the history, that the woman had labour'd under the one, rather than the other; especially as another woman; who had been, likewise, suppos'd to be afflicted with a dropsy of the tube, from the same signs (*p*), and who, having been extremely well on the first day from the drawing off of the water, was soon after attack'd with unkindly symptoms, and died on the seventh day from the discharge of the water; show'd that water, to those who dissected the body, to have been collected betwixt the peritonæum, and the indurated omentum: and this is openly declar'd with a candour that deserves every kind of commendation.

And, indeed, that, agreeably to the same desire after truth, I may conceal nothing from you, take this for granted: if any one contend that these two cures of du Verney, related rather to the dropsy of the peritonæum, I have nothing to reply in objection to his opinion; especially, as it was not in his

(*n*) N. 64. in fin.

(*o*) Eph. n. c. cent. 9. obs. 100. n. 5.

(*p*) Ibid. n. 7.

power to examine by dissection, that virgin who was cur'd, and as the widow, whom perhaps he might have examin'd, he did not examine: and even in the place where he first related both these cures, there, as I have said above (q), he has expressly asserted, that he had seen none of them cur'd, who were troubled with an internal encysted dropsy.

71. In the mean time, till others can teach more certain methods of cure, I should suppose it would be better to imitate that cautious physician Targioni (r), and to be content to make use of the *palliative* cure in the internal encysted dropsy; which Schorkopffius (s) had, also, "principally" recommended. Targioni has many admonitions to this effect, which you may select, and prudently follow; not neglecting even this last, that when dropsies of that kind are already large, those postures, motions, and exertions, of body ought to be avoided, from whence the cyst may press too much upon the viscera, or the viscera upon the cyst. For with how much ease cysts, which are not very large, are sometimes ruptur'd, the history that I related to you above (t) sufficiently demonstrates. And a violent fit of laughter, in that woman, did the same thing which it had done in a man, of whom Hoffmann (x) has left us an observation. For he very properly argues, that from too violent laughing, the sac in the thorax, which had contain'd a great quantity of water, was ruptur'd; because the difficulty of breathing, which had existed before, together with a fix'd pain of the left side, was immediately chang'd into suffocation: and as this carried the patient off in a short time, in the left cavity of the thorax was found, not only a great quantity of water, but in the same place, also, many "lacerated membranes, and vesicles, separated from the vertebræ, and ribs, which pretty plainly show'd" a rupture of a sac, and perhaps a sudden effusion of very acrid water. For it is not always so easy to discharge the extravasated water by the urinary passages, as it happen'd then in that woman: for in the man even time was wanting. From whence you will, also, more easily understand, how greatly they err, who use the more violent remedies, against dropsies of this kind in particular; I mean such as emetics, and purgatives. And, indeed, Wepfer (x), having found, in a woman who had an ascites come on after an enormous vomiting, the ovarium enlarg'd in its bulk, and lacerated to a surprising degree, suppos'd the water to have flow'd out from hence, into the cavity of the belly. And you yourself will form the same judgment of those two women whom I have taken notice of (y) from Schacherus, and Guttermann, as being found to have an ascites, at the same time that there was a rupture in the dropical ovarium; if, in reading over the history of each woman (z), you observe what kind of medicines they had taken, and what effects they had suffer'd from thence.

But while I am desirous of gratifying your wishes, I have carried my discourse out to such a length, as I did not at all intend from the first; and that almost without perceiving it. I therefore make an end of writing at present. Farewell.

(q) N. 68.

(r) Cit. supra ad n. 64.

(s) Thes. 25. supra ad n. 69. cit.

(t) N. 69.

(u) Med. rat. t. 4. p. 4. c. 14. obs. 7.

(x) Apud Scorkopffium modo cit. th. 23.

(y) N. 64.

(z) Schacheri vid. §. 16. in fin.

LETTER the THIRTY-NINTH,

In which the internal preternatural Tumours of the
Belly that remain are spoken of.

AS I have treated sufficiently of the ascites, and other universal tumours of the belly, in the preceding letter; it now follows to speak of those which distend some particular parts thereof; some of the upper and lower, however, excepted: as the tumours, with which they are affected, are already written of in other letters (*a*). Valsalva then has left these five observations, relative to those which occupy the middle and the lower parts of the belly.

2. George Marchesi, a nobleman of Forli, who labour'd under a large internal tumour of the belly, had a pain in his back, and in his loins on the left side. His urine he discharg'd frequently, but the intestinal excrements not without the greatest strainings. He had an appetite for food. Yet all the parts of the body being, at length, quite emaciated, and extenuated; except that the left side of the scrotum had been long affected with a hard tuberosity; and on the last fifteen days of his life his feet having a very considerable œdematous tumour; his left foot was seiz'd with an erysipelas, and this noble youth died on the day following.

The belly being open'd, in its center a large bulk of tumour appear'd, which so compress'd the viscera every where, that if they were not forc'd quite out of their natural situation, they were, at least, very much contracted, and, in many places, of a livid hue; although, in other respects, as far as could be perceiv'd by the eye, sound. This tumour hung from the mesentery; being cover'd, on its whole anterior surface, with the omentum, which was extenuated, and in many places lacerated. The omentum being separated, and taken away from thence, the figure of the tumour came somewhat better into view. This figure was very irregular: and, on the upper part, two protuberances were extended towards the hypochondria, one on each side; so that one of them not only cover'd the liver, and the other the spleen, but these viscera were even considerably forc'd upwards thereby. And the stomach itself was not quite free from pressure; being somewhat confin'd by the middle body of the tumour, from which the two protuberances were sent off. And the weight of the whole tumour seem'd to be about five and twenty pounds.

(*a*) Epist. 36 & 38 ex parte.

But even in other parts, on the outside of the tumour, the whole mesentery was turgid with the same kind of substance, whereof the tumour consisted; and with this tumour another tumour was also join'd, of the same nature with that which was in the left testicle. That is to say, the nature of both those tumours was, in great measure, similar to that of cancerous tumours; and, in particular, of some which are observ'd in the breasts. The bodies whereof they consisted, most of them, approach'd to a glandular substance, and resembled puff-balls in their figure, or as they are call'd in our language *tartuffi*. They were of a different magnitude: some of them were whitish like fat, but others red like flesh; and many were even blackish, as if from concreted blood. In some of the interstices of the body pus, but in others ichor, and in some a yellow serum, stagnated. Yet in no part of the tumours was there more serum, than in that which was in the testicle.

3. We have, now, all the circumstances that relate to this history, a part of which I have already produc'd (*b*), having promis'd the remainder, with the observations of Valsalva; some select ones of which I then intended to publish in the latter end of his dissertations. And indeed this is not one of the most inconsiderable, if we attend to the extension, and weight, of the tumour, at the same time. For in regard to the former property, it does not escape me, that other large tumours of the mesentery have, sometimes, so extended themselves, in their upper part, to the liver, or spleen, as to have made physicians suppose, upon examining the abdomen of the patient, that one, or other, of these viscera, was converted into a scirrhus mass. But, here, besides that it cover'd, with its upper appendages, both the liver, and the spleen, it produc'd its lower appendage downwards, in so extraordinary manner, as to join it with the tumour of the left testicle.

You will read, indeed, the description of a steatoma, by those celebrated men Hebenstreit (*c*), and Matthia (*d*), which being in the mesentery, had drawn up one testicle within the belly to itself, instead of being extended downwards thereto; and although, in the second observation, it was produc'd to the femur, and surrounded the crural vessels, yet in neither did it ascend to the liver and spleen. But the weight of the tumour, in both of these observations, and still more in that which will be taken notice of below (*e*), was indeed greater than in that made by Valsalva. Yet who can deny that the tumour describ'd by him, was one of the large ones that are found in the mesentery, even when we consider its weight? Since Wharton (*f*), who mentions many of them, gives account of no more than two considerable tumours; one of which, having been observ'd by him, weigh'd about seven pounds, and the other that had been observ'd by Parey, weigh'd ten pounds and a half, though its size is said to be "wonderful, and almost incredible."

4. As to the symptoms remark'd in the living patient, you will certainly not expect me to say why, although he had an appetite for food, he became emaciated in his whole body, if you consider by which way the chyle is to be carried into the blood; nor yet why the feet swell'd to such a degree, if

(*b*) Epist. anat. 2. n. 67.

(*e*) N. 8.

(*c*) Dissert. de part. coalesc. morb. §. 17.

(*f*) Adenogr. c. 11.

(*d*) Commenc. litter. a. 1739. hebdom. 48.

you consider through what parts the iliac veins, and the cava inferior, pass. Moreover, the weight, and bulk, of the tumour did not only press upon the chyloferous, or sanguiferous vessels, but also the bladder, and intestines. For which reason, as the one could not easily be distended, and the other not easily dilated, the patient was under a necessity of making water frequently, and of discharging his excrements with great strainings.

The last of these circumstances is shewn, by Fernelius (*g*), to happen often in this disease, and for the same reason; and both of them, or, at least, a costiveness, and a difficulty in discharging the urine, you will see observ'd by Parey, and explain'd in the same manner, in the case I took notice of just now (*b*), which is also transfer'd into the Sepulchretum (*i*). In that case a pain is, at the same time, spoken of, which, as in our case, was very troublesome in the back, and the loins; and you know to which of the vertebræ the mesentery is connected. This pain, and difficulty of making water, are not wanting, likewise, in the next history of Valsalva.

5. A woman of sixty years of age, having complain'd, for many months, of a certain tumour in the umbilical region, began to be troubled with a heavy and oppressive pain, towards the back, which was sometimes attended with a difficulty in making water. The tumour was every day increas'd, though it was already as large as the uterus in a pregnant woman can be; and, in consequence thereof, the pain I have describ'd increas'd also: especially when the woman, being in a recumbent posture, turn'd herself from one side to the other.

Upon opening the belly after death, a great bulk of tumour appear'd. This tumour had its basis in the center of the mesentery, and was connected with the adipose membrane of the right kidney; but adher'd to the termination of the intestinum colon, in such a manner, that they could not be divided without laceration. The substance of the tumour was in some places firm, but in others soft, so as to resemble a steatomatous matter. The right kidney abounded with particles of sand, and had its pelvis very much dilated. But the remaining viscera were found.

6. Although it is not to be doubted, but that difficulty in making water, and the pain which lay towards the back, related, in some measure, to the kidney also; as this had sandy concretions form'd in it, and could not but have its proper membrane somewhat pull'd away, at the same time that its common, that is the adipose, membrane suffer'd distraction; yet this distraction was brought on by the weight of the annex'd tumour, and the frequent difficulty of making water, in the latter part of pregnancy, happens from the bulk of the greatly-enlarg'd uterus, with which this bulk of tumour, as I have said, might have been compar'd: and if we suppose it to have been more protuberant on the right side, near to the kidney, as that connexion seems to prove, it may from hence, also, be easily understood, how the dilatation of the pelvis had been brought on; that is, by the ureter being frequently compress'd, and the descent of the urine being obstructed.

But be this as it will, you will, perhaps, be surpriz'd at one thing, in both of these histories, which I have given you; I mean, that besides the pain in

(*g*) Pathol. l. 6. c. 7.

(*i*) Sect. hac 21. obs. 38.

(*b*) N. 3.

the loins and back, which was a necessary consequence from the weight of the distracting tumour, no particular pain is spoken of, that belong'd immediately to the tumour itself; or, at least, to those membranes of the mesentery, betwixt which it lay. But you will cease to wonder, when I shall have shown that the observations, and writings, both of the ancients, and moderns, agree with the histories of Valsalva. Under the name of ancients, I do not understand here, any more ancient than Benivenius, who flourish'd about the beginning of the sixteenth century. Yet I do not think that these diseases of the mesentery were unknown to those who wrote long before his time. For although they were not accusom'd to dissect human bodies, yet they frequently us'd to dissect the bodies of brute animals, in some of which it cannot be suppos'd but they must have met with this appearance, that I even met with in a little hen-chicken.

This chicken was greatly emaciated, and greatly voracious; yet her belly was equally tumid, as if she was about to lay an egg, which as yet she was too young to do. This tumour was made up of roundish and scirrhus bodies, many of the size of a bean, and some of the bigness of a chestnut, lying betwixt the folds of the intestines, and some of them even fix'd thereto; all of them of a granulated surface, and even granulated in their structure; except that one of the largest contain'd a great substance, every where surrounded by those very hard granules, and resembling a white, and tender, but juiceless, and almost friable suet: such as, in the preceding letter (*k*), I describ'd in the uterus, and the ovaria, of a certain woman. But here the ovarium was found, together with its very small eggs, as both of the pancreas were; and, if you except the increas'd magnitude, the liver also, and spleen, and indeed, the intestines themselves, were found.

It therefore does not seem probable to me, that no tumour had ever been observ'd in the mesentery, by cooks, by butchers, by those who sacrific'd beasts, and shown to physicians; since Galen, as I have taken notice to you already (*l*), had seen a scirrhus tumour round the heart, in a cock, and transfer'd the disease to human bodies. I should rather suppose, that what the ancient physicians might have hinted, in regard to this subject, had been lost by length of time, as so many other things have. For if Julius Pollux, as I have read in Ingrassia (*m*), "asserted, that strumous tumours are form'd even about the mesentery," certainly either the grammarian himself took the hint from some physician; or, if it happen'd that he saw it himself, it is difficult to suppose that the physicians who wrote from the latter end of the second century, to the beginning of the sixteenth (for they say that Pollux, as well as Galen, liv'd in the reign of the emperor Commodus) being admonish'd by a grammarian, should none of them have said a word about disorders of the mesentery of this kind.

7. Benivenius (*n*) then found "a callus" (by which I understand a hard tumour) among the mesenteric veins of a boy, that obstructed those veins by its pressure. And Ingrassias (*o*) found, in the mesentery of a black, who was publicly hang'd, about seventy strumæ, besides almost as many tumours,

(*k*) N. 34.

(*l*) Epist. 16. n. 20.

(*m*) De tumor. tr. 1. c. 1. comm. 2.

(*n*) De abdit. morb. caus. &c. c. 37.

(*o*) Comm. cit.

adhering.

adhering to the external coat of the intestines; in both which kinds of tumours; though some were of the smallness of a vetch, others of a hen's egg, and many of a middle size betwixt these two; was universally contain'd either a liquid, and a mucous matter, or a gypseous, and stony matter. Yet Benivenius, when he mentions the other disorders of the boy, says not a word of pain. And all who knew the black of Ingrassias, have, with a common, and full consent, asserted, "that he had been extremely healthy, till he was "hang'd," which is a circumstance really surprizing.

Nor, indeed, do I believe that Fernelius (*p*), when he, in general, asserted, that a tumour of the mesentery "gave no pain," had said it without having made some observations, from whence to make such a conclusion; notwithstanding he immediately adds this reason for his assertion, "that the part itself is incapable of pain." And this I believe still more of Arantius (*q*); as he seems to have observ'd tumours, in that part, so large, as "sometimes to exceed the size of a pine-nut, and the head of a child:" and he certainly gives the signs of it in such a manner, as to seem to have had before his eyes a structure similar to that which is describ'd by Valsalva (*r*), in Marchesi. For it is, says he, "a tuberos and unequal tumour, by reason of its being made "up of many glandular bodies, connected together; which being surprizingly increas'd in their magnitude, cohere with each other, and form unequal tumours, resembling mushrooms, and such-like vegetations.

But he gives this as the first sign of all, "that the tumour is indolent." Perhaps you will here say, that hard and cold tumours, as they call'd them, were observ'd by Benivenius, and Ingrassias; and that Fernelius, and Arantius, certainly did not intend to refer to any other. But certainly Benivenius (*s*), when he found a tumour of a different kind, which had already degenerated into a large abscess of the mesentery, remark'd that there had been tormina of the belly, which increas'd every day; and, being grown intolerable, kill'd the patient. And I do not doubt, but you have likewise read, even in the Sepulchretum, that colic pains, or pains similar thereto, have been observ'd to be the consequences of abscesses, and apostems, in the mesentery; according to the testimony of Mermannus (*t*), Folius (*u*), Wepfer (*x*), and Sennerius (*y*).

It does not, however, escape me, that these objections may be made: part of which did not escape Marcellus Donatus (*z*), who I see had read most of those things, that I have hitherto said, of tumours of the mesentery, whereof mention was made in books, even in his time. And as he openly contended, as much as any one, that the mesentery was affected with no pain worth speaking of; because, among its constituent parts, he acknowledg'd none to be endow'd with sensation, besides the nerves, and the membranes; the sense of which parts he did not, however, doubt, was made very dull and obtuse, by the great quantity of fat that lay round them; he judg'd that the pain remark'd by Benivenius, was not a pain of the mesentery, but of the intestines. That is to say, he suppos'd the pain to have been excited in that

(*p*) C. supra ad n. 4. cit.

(*q*) L. de tumor. p. n. c. 44.

(*r*) Supra n. 2.

(*s*) L. cit. c. 33.

(*t*) (*x*) (*x*) (*y*) L. 3. f. 14. obs. 30. §. 10. & §. 13. & seq.

(*z*) De med. hist. mirab. l. 4. c. 7.

tract of the intestines, in particular, wherewith the diseas'd portion of the mesentery was join'd, by the weight of a great quantity of matter, which created the abscesses, either compressing, or dragging it downwards; to say nothing of the acrid exhalation of this matter.

8. Though it is by no means incumbent upon me, to approve of every thing that Marcellus, as I have said, suppos'd; yet it does not seem possible to deny this, that *alvi tormina*; for these are the words us'd by Benivenius; signify pains of the intestines, rather than pains of the mesentery: or, if this should be doubtful to any one, because these words are presently added, "all the viscera appear'd to be found, the liver, spleen, and all the intestines, showing no mark of pain;" it is certain, that in other histories, at least, which I have taken notice of, "a colic," or "pains, like to colic pains," are expressly mention'd. And lest you should imagine that these only happen when there is an abscess, read Platerus (*a*), and Wharton (*b*), who observ'd "colic pains," in those persons, in whose mesentery the former found "hard and glandular tumours," so grown into one substance with the intestines, that, by freightning their canal, they hinder'd the descent of the excrements; and the latter, a single tumour, but so large as to thrust the intestines to one side: and that "a glandular, and fleshy, more than an humoral, tumour."

But if in the observations of Valsalva (*c*), and others, that I have quoted above (*d*), these pains are not said to have been brought on, by tumours of this kind, it is to be suppos'd, that in some the intestines were not equally compress'd; and in others, that they had not an equal quantity of fæces, or that the fæces were not equally acrid: which first circumstance you will particularly suppose of the woman, whose mesentery, as you will see in Coiterus (*e*), was "made up of many, and those pretty large, scirrhi;" but she could scarcely swallow any thing, even that was liquid. So you will say that there were some other causes, if not the same, even in particular abscesses of the liver; for we do not read of them all being attended with pains. Excruciating tortures are indeed taken notice of by the same author (*f*), in the description of a large abscess; but they were such as may be refer'd to the difficulty of making water, and the other inconveniences that are related: since not the least mention is made of pains of the belly, or intestines. And, indeed, Donatus (*g*) gives an observation made by him, of a large abscess; as a great quantity of bloody and purulent matter, which was discharg'd by stool, and a fordid ulcer of the length of a span, which remain'd in the mesentery, demonstrated: whereas, in a very long sickness, no complaint was ever heard of pain, unless on the last day of her life, and disease.

But much more surprizing than others is the history of Hearnius, which you have in this twenty-first section of the Sepulchretum (*h*). For in this history, though other symptoms are describ'd, there is not a word of pain in the belly. Which circumstance is not so surprizing, on account of twelve, or more pints, of fluid matter, that was in the triple tumour, as on account of the weight

(*a*) Sepulch. obs. 30. cit. §. 11.

(*b*) Alenogr. c. 11.

(*c*) N. 2. & 5.

(*d*) N. 7.

(*e*) Obs. anat.

(*f*) Ibid.

(*g*) C. 7. paulo ante cit.

(*h*) Obs. 36. §. 1.

of the whole tumour, which was equal to fifty Swedish pounds; and its situation, which was almost the whole space of the mesentery. To this may be added, that the tumour was closely connected to the intestines, from the duodenum to the middle of the ileum, as if it had coalesc'd into one substance with them, so that it could not be separated without rupture; and that the quantity of food which was taken in, was scarcely sufficient to satisfy the desire of the patient; as his appetite was continual, and almost canine: so that we are not at liberty, here, to suppose either a small quantity of excrements, or that the intestines were not compress'd; but a far different reason must be thought of by any one who would endeavour to account for the absence of pains, which I shall endeavour to do below (*i*). For at present, it is necessary to point out other observations, in which these pains were not absent, that you may add them to the Sepulchretum.

There is one of Dolæus (*k*), wherein a tumour, something less than that describ'd by Valsalva (*l*), but of a structure not unlike it, was attended with dreadful tensions, and a troublesome sensation, as if living whelps were nourish'd in the belly; but the tumour arose from the mesentery: however, "it was fix'd to the small intestines, in several places: and the intestines even pass'd through its substance." The second observation is that of Verdrius (*m*), who describes the whole mesentery as being "steatomatous," after tormina of the belly, and not without a large abscess; but, at the same time, describes the intestines as "cohering closely to one another." The third observation is that of Laubius (*n*) on a man, who, being afflicted with very troublesome pains of the belly, had tubercles in the mesentery indeed; but his intestines were also fill'd with a great number of "steatomatous" abscesses of the same kind. On the contrary Goekelius (*o*) remark'd the whole mesentery, in a most noble count, to be beset with a great quantity of scirrhus and sebaceous fat; and yet "there had been no tormina."

To conclude therefore; in the observations produc'd both by the ancients, and moderns, either pain is not said to be join'd with a tumour of the mesentery; or if we do read of it as join'd therewith, it does not appear to have been in the mesentery itself, rather than in the intestines. And much less does it appear in the history of Jo. Scultetus, which is extant, likewise, in the Sepulchretum (*p*); for it does not sufficiently appear, that the excruciating pains of the belly were on the outside of the intestines; and if it did appear; as the very acrid matter, which was contain'd in the six tumours of the mesentery, is said to have corroded, to a great degree, all the vertebræ of the loins; those who attended to the other observations, would not be at a loss to conjecture a different seat of the pains, or of the origin of pains, on the outside of the mesentery: as they certainly would not, in that example which follows:

9. A woman, of eight and twenty years of age, had been troubled, for the space of four years, with pains of her belly, which were sometimes attended with a slight fever: at length, being grown more violent, they carried her off.

(*i*) N. 11.

(*k*) Eph. n. c. dec. 3. a. 5 & 6. obs. 258.

(*l*) N. 2.

(*m*) Act. n. c. tom. 1. obs. 87.

(*n*) Eorund. tom. 2. obs. 108. partic. 2.

(*o*) Eph. n. c. cent. 6. obs. 94.

(*p*) L. 3. f. 14. obs. 30. §. 12.

The abdomen of the carcase did not appear to have any of that external tension, which had been about the umbilical region, in the living body. Yet in the center of the mesentery were two tumours. One of which, being of the bigness of a goose's egg, lay towards the right kidney, and was internally ulcerated; yet without containing any thing purulent: but the other was much larger. For it was continu'd to the right kidney, insinuating itself, in such a manner, betwixt the internal, and external, coat thereof, as to cover the whole kidney, and could not be pull'd away from it without the greatest difficulty; and it extended itself quite to the os pubis of the same side, being equal in thickness, in some places, to two fingers, and, in others, to three. This tumour at first sight resembled coagulated blood. But the whole of it was invested with firm membranes, that were given off from the peritonæum: and it consisted, in many places, of a substance extremely similar to fleshy fibres, except that they were here ting'd with a black colour, and, in some places, were so lax, that they seem'd to be nothing more than concentered blood.

10. If I were certain that Valsalva perform'd this dissection while he was as yet a very young man, as I suspect he did, I should certainly believe that some aneurism was describ'd in this second tumour. But although it was nothing more than what it then seem'd to him to be; that is, one of those tumours of the mesentery, of which the question is here; it certainly could not extend itself quite to the pubes, and to the right kidney, so as to cover it, without forcing, and compressing, the intestines; nor insinuate itself betwixt the coats of that kidney, and affix itself so closely to the proper membrane of these two coats, and the kidney itself, without creating long and grievous uneasinesses; although they have their origin in that part, yet very often extend themselves to the intestines, and very often seem to be pains of the intestines, rather than of the kidney, as you are by no means ignorant. In the mean while, I would not have you believe it to be my opinion, that there can be no tumour of the mesentery, which is itself the seat of pain: I only would have you understand all the remarks that I have hitherto made, and produc'd, in such a manner as to perceive, that there is none of all these observations, from whence it plainly appears that the pain was in the tumour itself.

11. And this is really surprizing; whether you consider the quantity of nerves in the mesentery, or the office of its glands. For in the breasts is a far less number of nerves in proportion: so that if the glandular tumours of these parts brought on the most excruciating pain for this reason, because "the crude chyle being apt to contract an acrimony, or sharpness, cannot be sent into other parts in so crude a state, and in so great a quantity," as into the breasts; there would certainly be a more severe pain in the tumours of the mesentery (the glands whereof the learned gentleman does not seem to have attended to, when he wrote these things) as into this part the whole of the chyle flows; and, what is more, in a still cruder state. You would say that in the mesentery it is diluted with the lymph, and that it goes on therein, in order to arrive at a farther stage, instead of stagnating, as it does in the breast; unless the incipient tumour itself should cause a remora, both to the lymph, and to the chyle, and soon after suffer the lymph, as the thinner fluid, to slip by, and retain the chyle.

Does the pain, then, which is actually seated in the mesentery, seem to be in the intestines, the nerves that go thither being prick'd, just as happens in the foot which is already amputated? Is there not a humour in all tumours of the mesentery, which may thus prick the nerves? Or is there a humour in some which may blunt the sensation of the nerves by relaxing them? Or are the nerves, in consequence of their being intercepted by the hardness of these tumours, sometimes made incapable of the office of sensation, just as they would be by having a ligature made upon them? But if we suppose this, you will not be able to conceive afterwards, how it happen'd that Laubius (q) remark'd "tormina, about the navel," when "a hard and compact steatomatous abscess, which exceeded the size of a man's fist, was seated in the posterior part of the mesentery, where it is connected to the lumbar vertebræ, surrounding the larger vessels of that part."

For, according to this hypothesis, it seems that the nerves lying upon these vessels, and going to the mesentery, and intestines, must have been intercepted, and compress'd. See then that you think of some other hypothesis to add thereto, and consider of the other explanations, which I just now hinted at, and accommodate the other hypothesis to other observations. None of which, or at least none of those that we have attended to, you can suppose explicable by you, in the manner Bierlingius (r) has hinted; as he thought "that through so many ages, so many authors were deceiv'd;" if not always, yet "many times;" while being ignorant of the real use of that large gland in the center of the mesentery, and of the receptaculum chyli, they had, after death, from this which was even then full of chyle when cut asunder, "generally made an abscess of the mesentery:" as if either the abscesses which most authors have given the relation of, were not describ'd to be full of a fluid quite different from chyle; or as if that large gland was the same in the human body, as it is in that of the quadruped species.

I omit the different situation of some abscesses and tumours, and the number, or the magnitude, of the greater part of them which have been observ'd, even in the living body. Nor shall I deny what the celebrated Haller (s) thinks; I mean that the mesenteric glands, "which are sometimes very large" indeed, in younger animals (but agreeably to the receiv'd law of nature "in conglobated glands) have been taken for diseas'd glands, when they "were very sound." But when there are either many more than this law requires, or they are harder than is natural, there certainly is no room for this suspicion; as, for instance, in that dissection of the boy which I have quoted (t) from Benivenius. For he would not have call'd the tumour "a callus;" nor have said that "all" the meseraic veins were obstructed thereby, if he had not found a tumour amongst those veins, which was not only large, but very hard.

However, in regard to the hardness, both the different nature, and the different age, is to be consider'd in these tumours. And how often their nature approaches to that of a steatoma, you might have observ'd from most of the observations which have been produc'd. And yet it is very different at

(q) Act. n. c. tom. 2. obs. 108.

(r) Eph. n. c. dec. 1. a. 2. obs. 152.

(s) Not. 2. ad §. 128. prælect. Boerhaav. in. instit.

(t) N. 7.

different times. See, for instance, those medical themes of that excellent anatomist Solomon Alberti, which are publish'd, together with his three orations, and relate to the diseases of the mesentery, and pancreas. You will find many things therein, by which some of the remarks I have made above (*u*) are confirm'd; but the following words in particular: that the humours putrefying in the mesentery, "sometimes raise it up into a tumour, which is "at first lax and soft; but in process of time, the humours gradually drying "away, becomes so hard, and gives so much resistance to the touch, that in "the parts about the navel, and the lower part of the belly, you would think "either a bone or a calculus had been form'd." But, on the other hand, it happens, at different times, that those parts which were hard grow soft by putrefaction. And to this class, among others, belongs that observation also of Andreas Vespithalus (*x*), who having found in the belly of a woman, but principally about the navel, "many hard tumours, which at length grew "soft again in a course of time," saw in her body, after death, the mesenteric glands "for the most part ulcerated, but some still indurated."

Now, however, let us see about those tumours that belong to the lower part of the belly.

12. A woman, of forty years of age, began formerly, after the abortion of a fœtus of almost five months old, to observe a certain hardness about the uterus, and to be attack'd with a pricking pain, in the same part, which was slight indeed, but continual. Sometimes she was feverish. The tumour, in the mean while, increas'd outwardly; yet in such a manner as to be moveable: for it was sometimes perceiv'd in the middle, and sometimes at the sides. She had a considerable pain in her head: she went to stool with great difficulty: a vomiting was at times troublesome: and the pain in the tumour was, at certain times, so excruciating, and particularly when it was increas'd by uneasiness of mind, as to excite an ardent fever, and to be almost intolerable. These circumstances which I have mention'd happen'd within ten years: in which time she never conceiv'd. Finally, the tumour being become immoveable, and the pain, and the acute fever, being very violent, she was no longer number'd with the living.

The belly being open'd, a very great bulk of tumour was found by Val-salva, so as to be equal to the size of a very large human head. This tumour was seated in the posterior paries of the uterus, vehemently compressing the intestinum rectum, and being closely connected to the surrounding parts. Externally, indeed, it seem'd of a fleshy colour; but in its substance, it was more firm than flesh: and within this substance contain'd two sinous cavities, the parietes of which resembled putrid flesh. One of these cavities was empty; but in the other was contain'd a serous matter. This tumour also occupied the seat of the ovaries. For which reason no traces of these parts remain'd: except that at the sides of the tumour were seen vesicles turgid with serum; some of which were equal, in their magnitude, to that of a pigeon's egg. Part of the serum collected therefrom was put on the fire, and part of it mix'd with acid juices. Yet neither of these portions did in the least coagulate.

(*u*) N. 4 & 7.

(*x*) Dissert. de parte intest. jejuni & cat. c.
3. §. 60.

13. This case needs no explanation : so exactly do the appearances, found in the dead body, answer to what had been observ'd in the living. That is to say, the hardness coming on after abortion, the pain, the tumour when at length grown manifest, the seat thereof, and the defect of conception for the space of ten years, though in a flourishing time of life, sufficiently argued a tumour of the uterus : nor did the pain of the head, the vomitings, and the violent increase of pain in the tumid part, and particularly from the mind being disagreeably affected, argue differently from the preceding symptoms : but the severity of the tortures, and the fevers, demonstrated the malignant nature of the tumour ; as the difficulty of going to stool, rather than making water, did also demonstrate to which part of the uterus it chiefly adher'd.

There was one thing, which, if you attend to Arantius (y), may not seem to be very compatible therewith. For this author, in speaking of the marks whereby we may distinguish tumours of the uterus from those of the mesentery, says, that those of the uterus "are painful, equal, endow'd with an oval form, and are not entirely mov'd from their places." Yet the tumour in our case was moveable for a long time ; and would, perhaps, have continued so for a very long time, nay perhaps always, if it had not at length fix'd itself to the neighbouring parts very closely. Had Arantius, therefore, lit only on such tumours of the uterus, that were already become very large, and connected to the parts about ? Or has he made use of words, which seem to signify that these tumours are more immoveable than he meant to assert ? Be this as it will, it was much more easy in the preceding history, than in that which follows next, to conceive, before dissection, in what part the tumour of the lower belly consisted : nor did this escape the sagacity of Valsalva, as you will immediately learn.

14. A slender woman, of about forty years of age, being much subject to the hysterical passion, and particularly to violent paroxysms thereof, which shook her whole body, but principally the viscera of the belly, with convulsive motions ; and having, at length, undergone some that were more violent than the rest, began to observe a manifest kind of depression in the epigastric region, and a manifest fulness in the hypogastric region. The former was never chang'd ; but the latter frequently within the space of one day. For although it show'd a pretty large and very hard tumour, yet this very often subsided of a sudden. In like manner, when aliment was taken in, the woman perceiv'd it to be carried down quite to this tumour ; that part being from thence more elevated : and the sense of weight, which was always in that place, became more burdensome : and four or five hours after, very severe pains, tormina, and swoonings, were brought on. The patient often complain'd that all her entrails ; for this was her very expression ; were fallen down from their situations. Her digestion was manifestly deprav'd : she was feverish : and very much emaciated. Having liv'd in the manner I have describ'd for three months, she died.

In the carcase was found what Valsalva had predicted in his opinion ; that is, the stomach fallen down to the hypogastrium ; so that scarcely four fingers breadth lay betwixt this viscus and the pubes. But it had a different position.

from that, which the editors of the *Bibliotheca Anatomica* (z) have represented, from a certain virgin. For the part of the stomach which corresponds to the gula, was here extended, in length, to such a degree, that the whole of the fundus lay in the hypogastrium.

15. This diagnosis of Valsalva was indeed very extraordinary, and the observation no less rare. To begin with the latter; I would have you observe that the state of the stomach, in the hypogastrium, may be very different. For sometimes it is so very large, that in a woman whom I dissected, in the hospital, about the middle of December in the year 1717, I saw the fundus of the stomach to be no farther distant from the os pubis, than in the woman in question; and demonstrated it to those who were present: to whom it seem'd so much the more surprizing, on account of its being empty. For that it may descend so far when it is immoderately distended, either with flatus, or included humours, that women may be suppos'd to be far advanc'd in their pregnancy, or to labour under an ascites, is known from the observations of Moinichenius (a) in particular, and Jodonius (b); the latter of whom saw the stomach, "when cut through the middle, to be longer than a Parisian ell;" and the former, in this very theatre of our college, saw "the whole abdominal region occupied; and the intestines cover'd, therewith." And to what a degree the celebrated Widmannus (c) found it extended, in a man who us'd to fill himself every day with an almost incredible quantity of bread, and beer, the description of it shows.

But the stomach sometimes occupies the hypogastrium also with some part of its bulk, as it does other regions of the belly; not on account of its magnitude being increas'd; but, having its usual and proper size, either at one extremity, for instance the right, as in the example already refer'd to (d) in the *Bibliotheca Anatomica*; to which you may add another of Mery (e); or in the whole of it, falls downwards. And it may fall down to the lower parts of the belly, either in consequence of being drag'd downwards, or forc'd from above.

In the patient of Vesalius (f), it was drawn "downwards from its situation, in such a manner," that the very function of the stomach was deficient; and a singultus coming on, death was the consequence thereof. It has also been drawn down, by almost all the intestines having fallen into the scrotum; as in that observation of Mery; or into a very long sac, as in another observation made by the celebrated Henry Papen (g). And it has been driven downwards in other bodies dissected by Valsalva (h), or by me (i), by the diaphragm forcing it from above; or being depress'd: or by the liver being greatly increas'd in its size; of which last kind, in particular, are two observations of Fantonus the father (k): and I take notice of all these examples here, that I may, in general, point out the causes of the depression; and not because the stomach was really thrust down quite into the hypogastrium.

(z) Part. 1. ad Glisson. tract. de ventric. & intest. c. 2.

(a) (b) Sepulchr. sect. hac, 21. obs. 42. & 48.

(c) Act. n. c. tom. 6. obs. 149.

(d) N. 14. in fin.

(e) Mem. de l'Acad. R. des sc. a. 1701. obs. 5.

(f) De corp. hum. fabr. l. 5. c. 4.

(g) Epist. de hern. dorsal.

(h) Epist. 17. n. 25.

(i) Ep. 21. n. 24.

(k) Obs. med. anat. 5. & 24.

In the hypogastrium, however, it was seen by Ruysch (*l*), when he dissected the body of a woman who had died of an asthma. But neither is the cause shown, why “this viscus, together with the intestines, left its natural situation, and occupied the hypogastrium;” nor what inconveniences had been the consequences of this unusual situation, in the living body: for which reasons I purposely omit other observations of its descent; especially when in a less degree. But those things which have been lately observ’d by that celebrated man Molinelli (*m*), related rather, as I suppose, to another disorder that was join’d therewith; I mean to a very large and hard tumour intirely shutting up the beginning of the intestinum duodenum; from whence, not only the very difficult and long-continued vomiting of all the ingesta, the very great wasting, and the icteric colour, may be accounted for, but also that “very great magnitude of the stomach, which descended quite to the region of the pubes, and occupied almost the whole hypogastrium;” as the preternatural increase of length in the œsophagus, and, consequently, the *prolapsus ventriculi*, may be likewise. For as the annex’d pylorus was more depress’d, on account of the weight of that tumour, so by reason of the passage, from thence to the intestines, being shut up, the the several ingesta had not only enlarg’d the stomach, by being confin’d there for a long time; but, finally, by frequently irritating them, and by forcing them into violent contractions, which the very difficult vomiting was a proof of, had drawn down the œsophagus, that is connected with the other orifice, and made it longer: so that in this case a prolapsus of the stomach was added to its increase of size: and that not from causes which forc’d it downwards from above, but drew it downwards from below.

Now if the observation of Valsalva be compar’d with all these, it will appear of how extraordinary a nature it is.

16. Valsalva then did not find a part of the stomach (either on account of its magnitude being increas’d, or of the situation of one extremity being chang’d) but the whole fundus, in the hypogastrium, and not in the umbilical region. The convulsions of the viscera, that are contain’d in the belly, had drawn this viscus down in so violent a degree, by extenuating that part which is continued into the gula, and by this means rendering it longer. For although Molinelli (*n*) saw the gula itself become longer; and Fantonus the father, in the first of the two observations (*o*) which I have spoken of, has remark’d that frequent complaints were made by the patient, of the tongue seeming to be drawn back towards its basis; which was no inconsiderable argument, as the very learned son has interpreted it (*p*), of the œsophagus being drawn, and extended downwards; (nor, indeed, is it to be denied that some part of the great length which Valsalva saw, was a consequence of the œsophagus being carried downwards) yet as he himself has acknowledg’d, that it was the stomach chiefly which was distended, it does not become me to deny, that the length is chiefly to be attributed thereto.

And if the observation of Valsalva were not very singular, among others,

(*l*) Obs. anat. chir. 56.

(*m*) Comment. de Bonon. sc. acad. tom. 2. p. 1. in medic.

(*n*) N. 15. in fin.

(*o*) Obs. 5.

(*p*) Schol. ad eand. obs.

on account of these peculiarities which I just now observ'd, it certainly would be so, on account of this difference; I mean, that although in the other observations, some of the remaining parts of the belly were much affected with disease, at the same time, as the omentum, the liver, one of the kidneys, the pancreas, the duodenum, or some other intestine; and not to omit other injuries of the stomach itself, either the pylorus almost obstructed, or all the parietes greatly relax'd; in the observation of Valsalva was nothing of this kind: but taking away that production of the upper part of the stomach, whatever disorder there was, consisted in the prolapsus of this viscus: so that it seems to have been made in order to learn the peculiar signs of this disorder; which are in fact so express and clear therein, that the difficulty, which I have asserted to be greater in distinguishing this tumour, than that of the uterus, (*q*), is not to be estimated from the obscure signification of the signs, but from the rareness of the disorder refer'd to.

However, even the rareness of the disease, itself, is not sufficient to baffle the sagacity of those who know how to inquire skilfully into the symptoms, and consider them duly; that is to say, in other words, the sagacity of a man "practis'd in dissections," as Valsalva was, "and in finding out the "operations and uses," of the internal parts: which two circumstances Galen (*r*) absolutely insisted upon as indispensable, in those physicians who "desir'd to obtain the capacity of distinguishing diseases of this kind from "one another;" after having shown in what manner he himself had found out the stomach of a certain man to be small and round; and the bladder of another to be small and prominent; and other things which were still more obscure than these.

17. The same author had taught, a little before (*s*), "that all things "which are within the body cannot be certainly known;" and (*t*) that those which do not fall under the notice of the senses, "we must endeavour to attain to by the most artful conjecture, if not by the most certain science:" and having said all these things that I have related, of those internal constitutions that are deriv'd from nature; he has presently after shown (*u*) that such states of these parts, as are the effects of disease, are to be distinguish'd "from their operations being injur'd, or deprav'd; or from the various excretions; or from pains, or preternatural tumours; or from some or all of these united." And learnedly, as it became so great a master, has he, in this manner, shown us the seats, and, as it were, the sources of diseases.

But there is often such a complication of disorders, such a consent and vicinity of parts, that this "most certain science," of which he speaks, is rarely to be expected: more generally "an artful conjecture" must be attempted, and modestly and diffidently propos'd. And as I have been wont to do this upon other occasions, so I thought it behov'd me to do it in some cases, which are not very commonly known; and which will be in the number of those that I shall now subjoin, in such an order, that if they do not correspond with those which I have given you from Valsalva, in the nature and seat of the tumours, they may, at least, correspond with them in the tumours hav-

(*q*) N. 13. in fin.

(*r*) Art. med. c. 74.

(*s*) C. 71.

(*t*) C. 72.

(*u*) C. 75.

ing occupied the middle, or lower region of the belly : although that tumour, with which I shall begin, was in part fix'd to a higher situation, and did not much differ in its nature from one of those (*) that are describ'd above, if we do but allow of an aneurism in that observation, and this of mine ; in the former of which, by reason of the brevity in the history of the symptoms, and in the latter, by reason of no dissection having follow'd, we cannot affirm the thing for a certainty.

18. A chaste and pious virgin, of four and forty years of age, who had as yet had a plentiful and regular evacuation of blood from the uterus every month, having this discharge entirely obstructed for one or two months, began to complain of an itching of the eye brows and eyes, and of palpitations of the heart, as she herself said ; which were short indeed, but frequently recur'd. These palpitations being grown more violent of a sudden, and continual, I was call'd in. The patient, then, in order to point out the seat of the disorder to me, did not lay her hand upon her breast, but upon the epigastrium. Laying my hand upon this part, I perceiv'd a certain hard and large body to be vibrating, and striking the hand with a great impetus. You would have said that there was a large aneurisinal tumour beneath the hand, which every now and then doubled its pulsations, and occupied no small space in the middle of the upper and neighbouring regions of the belly. And in this light it appear'd to others.

My opinion, indeed, agreed with theirs in this ; that these pulsations had no relation to the heart : inasmuch as there was no vibration in the breast, and the pulse, when felt in both wrists, shew'd nothing different from the natural state, except that it was a little more frequent. But in regard to the aneurism, I could not assent to their opinion ; not only for other reasons, but, particularly, because the times of these pulsations did not at all agree with the times of the pulses in the wrists. For their intervals were very unequal, as their force was also ; as sometimes the hand was stricken with a very strong, and, at other times, with a less strong impetus ; when, at the same time, not the least change was observ'd in the pulse at the wrists.

Yet it was much more easy to say, what this tumour did not seem to be, than what it did seem to be ; being large and hard, as I have said before, and comprehended in the circumference of a circle, as if it were raising itself up, every now and then, from the vertebræ of the loins, to strike against the hand ; but immediately withdrawing itself in such a manner, that, even in a slender virgin, it was not easy to find out whither it had receded, till it again rais'd itself up, and struck against the hand. And although it came readily to my mind, that a globular kind of tumours are frequently perceiv'd in the bellies of hysterical women, which ascending upwards from the lower part, are very troublesome to them ; yet, on the other hand, it was equally obvious, that these tumours are not attended with pulsations of this kind, so as to resemble aneurisms.

Nevertheless, considering this, and other things that might be said against it, and weighing them in my mind ; and, at the same time, attending to those things of an extraordinary nature, which are often met with in women, contrary to expectation ; I found myself inclin'd to conjecture that

whatever this disorder was, it might certainly be refer'd to the class of convulsive and hysterical affections.

Yet this conjecture of mine I did but just hint; and omitting all controversy; as my custom is, at the bed-side of patients, when we agree, in other respects, as to the remedy; I immediately assented to her losing blood, as the evident foregoing cause requir'd. Which being done, the patient immediately began to be so much better, that on the day following no palpitation any longer remain'd. And she, certainly, did not complain of it again; at least for the four or five months that I remain'd in the place of my nativity; till, in the year 1711, I came here to take upon me the professorship of medicine. But by what disorder she was carried off, for she died some years after, I could not learn for a certainty, as I was then here, and her body was not dissected.

19. The arteries which, if they are dilated into an aneurism; may produce a very great pulsation in that part of the belly which is pointed out, in the history in question, are the *cœliaca* with the largest of its branches, the *mesenterica superior*, the right *emulgent*, and the great artery: but the latter of these much the most frequently of them all; and the others very rarely, if you except the *cœliac*. For to the causes which are common to the others; as, for instance, erosion, constriction, and those of a similar kind, you will, moreover, add, with me, this which is peculiar to the *cœliac*, when you attend to those frequent tortuous flexures; whereby, as the course of the blood to the spleen is retarded in the splenic branch of that artery; so a great part of the blood, and the impetus of it, is reflected into the branches which arise therefrom, before these obstacles are come to; so that if any of those causes be added, which continues to act very violently, and for a long time together, an aneurism may be easily produc'd.

But although there are so many arteries in that part, and more than one cause whereby they may be dilated, there are also many things which ought to render us cautious, lest we, at any time, heedlessly take a pulsation for the mark of an aneurism being already begun. The first is great leanness and thinness of body, as we even gather from what Berengarius (y) formerly admonish'd us of, in order to refute a mistaken opinion to the contrary, of certain physicians, in the case of an emaciated woman. His admonition is as follows; "by means of the great artery, a great pulsation is frequently perceiv'd in the region of the stomach, and intestines, and especially in extenuated bodies."

Nor did Prosper Martianus (z) hesitate to explain from this cause, even that very great pulsation which is said to have been just in the very same situation in the son of Eratolaus, in the seventh book of Epidemics (a), that it was in the virgin I am speaking of; the words run thus: "in the middle situation betwixt the navel, and the *os pectoris*, was perceiv'd, by applying the hand to this region, such a palpitation as could not be generated about the heart, either by running, or by fear." Yet this, according to the opinion of Martianus, "was nothing else but the motion of the great

(y) Comment. 9. super anat. Mundini.

(a) N. 3.

(z) Adnot. ad vers. 55. sect. 2. coacar. prænot.

“artery, which is in others obscur’d, and stifled, by the flesh that lies betwixt this vessel, and the hand;” for in that patient, in consequence of his being wasted away to the greatest degree conceivable, the thickness of these parts, interpos’d betwixt the artery, and the hand, was so diminish’d, that the artery “might not only be more easily elevated, but more easily perceiv’d: and although this is common to all the arteries, of the body; yet it is, nevertheless, observ’d most frequently,” says he, “in the middle situation betwixt the navel, and the os pectoris;” the reason of which is, that there is no other part where a very large trunk of an artery is subjected to the hand, without the interposition of any bone: and that in the same place, other arteries, which I have just now taken notice of, exert their pulsations.

The second circumstance, whereby physicians may be deceiv’d from pulsation, is very complicated: but, by the same author Martianus (*b*), is reduc’d to the single article of plenitude; whether this be in the arteries, or in the veins, or in the flesh; which lying upon the arteries, and “compressing” them, cause their parietes to be elevated “with a greater impetus;” instances of which he produces in great inflammations, and those tumours that tend to suppuration. Yet Vallesius (*c*) had led the way to this doctrine, in the narration of the history of that patient, of whom I spoke just now. “A remarkable pulsation happens in many patients,” says he, “in that part of the belly, from the artery which goes down upon the spine, by reason of an inflammatory affection of that part; which pulsation sometimes happens in acute diseases also; and sometimes even remains after acute diseases and a cancerous affection happens in that place.”

But that even where any hard body presses upon the arteries, their pulsation is perceiv’d, he had asserted above (*d*), when he explain’d that “pulsation and weight,” which were observ’d in the belly of the wife of Gorgias (who had labour’d under a suppression of the menses much longer than our virgin) “which way soever she was turn’d.” For the uterus, says he, “being indurated, is carried, like a foreign weight, to which-ever side the body is turn’d to; and the arteries which are compress’d, endeavouring to free themselves from that compression, are perceiv’d to pulsate.” In consequence of which doctrine physicians have since observ’d, as you even see in the Sepulchretum (*e*), that the cœliac artery, or the aorta, being compress’d by a very great obstruction and turgescency of the pancreas, or the mesenteric glands, a violent pulsation is perceiv’d, as often happens in hypochondriac patients, or others.

20. If you transfer these considerations, and others analogous thereto, to the virgin of whom I have spoken, you will learn, in the first place, that the pulsation describ’d in her was not owing to an emaciated state; for though her body was slender it was not extenuated. In the second place, although there was some plenitude, from the retention of the menstruous blood, yet that it was not only from thence, for it was not in that place: nor yet from inflammation, nor a tumour which verg’d to suppuration; nor, in fine, from

(*b*) Annot. modo cit.

(*c*) Comment. in l. 7. epidem. n. 4.

(*d*) In l. 5. n. 11.

(*e*) L. 1. f. 9. in schol. ad obs. 38.

any considerable obstruction of the pancreas, or the mesenteric glands; as of all these diseases there were not the least signs. It remains, therefore, that, as these and other similar causes of compression were absent, the pulsation was either from some different cause, or from an aneurism.

What gave colour to the supposition of an aneurism at first sight, was the great bulk of body which struck against the hand. And if, as Albertini (*f*) has asserted, he “has many times demonstrated, from his not perceiving “the diameter of the vessel to be increas’d, that the strong and continual “pulsations of the cœliac artery, or of the aorta, in the abdomen, were “without dilatation; nor was the opinion invalidated by the event;” here, on the contrary, a dilatation did not seem to be wanting, since the pulsating body was perceiv’d to have so great a diameter.

However, it must be confess’d that it is not equally easy to avoid being deceiv’d, sometimes, in this second judgment; that is to say, when a body of some extent, which strikes against the hand, may either be a dilated artery, or a tumour lying upon an artery which is not dilated.

For if the artery is pretty large, and is compell’d, by the compressing tumour, to pulsate very vehemently, it will lift up the tumour with it; which we suppose to be not too heavy; and will force it against the hand of the physician. This circumstance, which every body sees so plainly, that nobody can deny it, happening sometimes even in the external parts, holds surgeons in suspense whether the disorder be an aneurism or not; as it did here in the neck of a certain girl, who had a tumour so contiguous to the left carotid artery, that it not only caus’d stronger pulsations of this artery, which it compress’d, but even pulsated therewith. Yet the whole tumour, as a more accurate examination, and a perfect cure demonstrated, consisted in one of the jugular glands being tumid, and already fill’d with pus internally.

So also, on account of the pulsation which was perceiv’d under a bronchocele, many had suppos’d that tumour to be an aneurism, which Severinus (*g*) (as he believ’d it to pulsate, on account of its compressing the carotid arteries) says he had, by dissecting it after death, demonstrated to be actually of such a nature as his opinion had predicted. And if we are in danger of falling into an error even externally, how much more danger must there be of being deceiv’d, in those parts which lie deep among the viscera? See, with what ingenuoufness, never sufficiently to be commended, those celebrated men Jo. Phil. Burgegravius (*b*), and Peter Tabarranus (*i*), have deliver’d down to posterity what happen’d to them. The former, in a case wherein a pulsation was observ’d from the navel, quite to the scrobiculus cordis; and that to so great a degree, as to be frequently heard by those who stood near; and which had continued for four and thirty years; suspecting it not to be from a true dilatation of the large artery in the mesentery, as the diameter thereof was not much enlarg’d; but that it might be from a spurious aneurism, as Lancisi call’d them; and supposing it to be incurable, by reason of having continu’d so long, saw the pulsation, contrary to all expectation, remov’d

(*f*) Comment. de Bonon. sc. acad. tom. 1. in opusc.

(*b*) Act. n. c. tom. 6. obf. 131.

(*g*) De recond. abscess. nat. l. 4. c. 6.

(*i*) Obf. anat. edit. 2. n. ix.

within a little time, by giving some remedies, in the mean while, which might, at least, serve to correct the crudity of the humours; and this after a great number of remedies had been made use of by others, to no purpose.

But Tabarranus, having found not only a pulsation under the epigastric region, but also a tumour of the bigness of a fist, and those join'd with the other marks of a true aneurism, was surpriz'd, afterwards, to find, instead of an aneurism, only a scirrhus tumour in the center of the mesentery, adhering so closely to the large vessels, that it could not avoid compressing the aorta, and being rais'd up by the pulsations thereof. These observations may be of service to you; to me, at the time when I had the case of this virgin before me, they could be of none, not only because they were publish'd so many years after; but, also, because the pulsations, in both of the observations, were made exactly at the same time that they were made in the rest of the arteries. Being induc'd therefore, by other doubts which I hinted at just now, to inquire into the remaining circumstances, I concluded that so large an aneurism, as this must have been, could not be form'd in so short a time, and without more violent symptoms preceding or following it; and that the pulsations of an aneurism could not but correspond with the motion of the arteries.

I therefore rather suppos'd the tumour to be of some other kind. That is to say, as I have hinted briefly above, I suppos'd it to be the effect of internal hysterical convulsions; which constringing some of the intestines here and there, and the mesenteric branches of the aorta, at unequal intervals of time, with a very considerable force, form'd, from those intestines, a kind of globe, as it were; which was distended with a confin'd and rarefy'd air; and, at the same time, compell'd the aorta to pulsate more vehemently, every now and then (inasmuch as the efflux of the blood from thence, into the mesenteric branches, was prevented) and impel the globe which lay upon it. But as I had it not in my power, as I have said before, to demonstrate that no dilatation of the arteries was conceal'd beneath that tumour, by dissection of the body, I will go on to another tumour which was plac'd in the same situation, and this a permanent one too, and examin'd by dissection. And as this was one of the very rare tumours; as the patient was a person of so much consequence; and as the case gave occasion to such controversies of opinion, that the history thereof cannot, nor indeed ought to be, comprehended in a few words; you will not be surpriz'd if I give it you more at large than I generally do others, and in an accurate and distinct manner.

21. Fortunato Mauroceni, whom the love of a religious life had drawn away from his illustrious employments in the republic of Venice; and from his very noble family (for he was nephew, by the father's side, of the Duke Francesco, who took his surname from the conquest of the Morea) into the venerable family of the Cassinian monks, and whose merits had remov'd him from thence to the bishopric of Treviso; and after that to the bishopric of Brescia; having from the very time he took upon him this new course of life, come out very seldom in public, and us'd himself quite to a sedentary life, as he was generally employ'd in the reading of sacred books; became, by degrees, subject to the hypocondriacal affection, and a flux of blood from the hæmorrhoidal

hoidal veins: yet, while this discharge was in a proper proportion, he enjoy'd a state of health, which was even more flourishing than he wish'd: that is to say, a very fat habit of body, and particularly a fat belly; till, at length, as he grew in years, the hæmorrhoidal flux at first began to be diminish'd; and after that to be entirely obstructed.

For when this discharge was diminish'd, he was troubled with certain pains of the belly, which he suppos'd to be from flatus; and were frequently sudden and momentary; but sometimes of pretty long continuance. And when he had now completed his sixtieth year, and no more blood was discharg'd by the hæmorrhoids, these pains began to be more troublesome, particularly in the autumn of the year 1726, which was the last he saw; at which time he also labour'd under frequent fevers. Of these he got rid by means of the Peruvian bark; and the pains were alleviated by the opportune return of the hæmorrhoidal flux. In the following winter, having his fever and pain return a second, and even a third time, he was always reliev'd by the same flux coming on again; but never perfectly cur'd: and, indeed, at this time a certain hardness first began to be perceiv'd in the belly, and a tumour.

On account of these disorders he came from Brescia to Padua in the following spring. With the other disagreeable circumstances was join'd a costiveness. To counteract this inconvenience, in as mild a manner as possible, a senior physician prescrib'd rhubarb to be chew'd now and then, mix'd with currants, from which the patient seem'd to be a little better: but some stronger purgatives being added, by another senior physician, he was much worse; as he was also by other things which were given him to procure stools; the patient being averse to glysters.

But even whatever remedy was given him, with a view to obviate other symptoms, he scarcely had taken it more than once or twice, but he threw it up again; that is to say, in consequence of its not being born on the stomach; which, in the mean while, being now frequently troubled with the most obstinate vomitings, that yielded to no kind of remedy, threw up, very soon, the food and the drink, that it took in; or if it did retain any part of them for a considerable time, brought it up at length, nevertheless, without its having undergone any change; as was the case with a boil'd apple which he had retain'd for eight and forty hours.

Besides his food, he also brought up a great quantity of water, so as even to exceed the quantity of what was taken in; but this water had neither taste, nor colour: nor during the whole course of these vomitings, which were so frequent, was any thing ever perceiv'd to be either bitter, or colour'd, if you except the food. As these things, and others, but particularly the tumour, (which I shall speak of presently) terrified the physicians, that very eminent man Michael Mauroceni the brother of the bishop, knight, and very illustrious senator, came hither from Venice, and order'd three other physicians, in the number of whom I was, to be sent for, in order to examine the patient, and consult with his physicians upon the case.

We found him confin'd to his bed, as he had been for some days, extenuated in his face and limbs, his flesh being warm like that of a healthy person; but his pulse rather more frequent: which two circumstances we were assur'd by his physicians had always been so; except that the frequency of the pulse

was somewhat increas'd towards the evening, and in the night. It was particularly begg'd of us that we would examine the tumour with accuracy. This was, as far as we could judge from feeling it, and even from seeing it; for it was obvious to the eye also, nearly in the circumference of a circle, the diameter of which was eight inches in extent, being plac'd in the midway betwixt the cartilago enfiformis, and the navel; in such a manner as to be distant from both of them by some little space (such was the prominence of his belly by reason of fatness) rising up from the circumference of it gently towards the middle; and having the skin, wherewith it was cover'd, just of the same colour that it was of in other places.

If you handled it, you perceiv'd it to be an unequally tuberos tumour in its whole surface, and even in the very circumference of it, just as if it had been made up of glandular bodies; which seem'd also to be confirm'd by the resistance it gave when you press'd it. When it was press'd upon, and, in like manner, when the patient was troubled with flatulency, a sense of pain, but not very violent, arose in the tumour: besides which accident, there was no complaint of it, except of a fix'd, but slight, uneasiness, as if from any little impediment. By laying hold of the tumour with both hands, I easily drew it to one side or other. That it did not occupy the parietes of the belly it was easy to see; and, at the same time, that it was, nevertheless, very near thereto.

When I examin'd accurately with my hand what was above, below, and at the sides of, the tumour, except that I did not go on to examine below the navel, (the physicians, and the patient, asserting that nothing preternatural was there) nothing hard or resisting was perceiv'd; as far as the fat of the belly, which lay between, would suffer me to distinguish; nothing unequal, nothing which created any uneasiness upon being press'd. Having made these enquiries, and examin'd the urine, in which was nothing at all to be found fault with, and the water that was, as I have said, thrown up by vomiting, and made every other inquiry, or examination, we thought necessary, we retir'd, in order to compare our opinions with each other, before that very illustrious senator, and a great number of other persons, who were eminent either for their dignity, or their learning, as well as those who were students in medicine; the physicians, and even the prelate himself, having heard what I have already related to you.

22. When we were withdrawn from the patient, one of the physicians, under whose care he had been, gave us a long dissertation upon the nature and seat of the tumour, the sum of which was this; that he believ'd the tumour to be scirrhus; but a spurious one, because it was painful when compress'd: and that it had its seat in the omentum, because it was moveable and external; or perhaps in the mesentery, if any one should choose rather to suppose thus; for that this was moveable, and furnish'd with that large gland which is call'd the pancreas asellii, the tumour of which might grow outwards in such a degree, as to come to the anterior parts of the belly, as he said he had seen in a certain carcase (as if that pancreas either were found in the human subject, or as if it were possible to draw the whole tumour of a gland, plac'd in the immoveable center of the mesentery, as this pancreas is, to one or the other side, with the hand): as to the obstinate vomitings, it seem'd to him that there was some excrescence in the ring of the pylorus, which prevented the aliments passing through it; and that these, when retain'd, irritated the

the stomach; or at least that the cause of this vomiting was, certainly, not beyond the ring of the pylorus, because there never appear'd any mark of bile in the matter that was discharg'd.

He, therefore, asserted that, by reason of the vomitings, the most extreme wasting of body, and a slow lingering death, could not be avoided in the end; but that on account of the tumour it might happen to be speedy, in consequence of a purulent matter, together with blood, being effus'd from thence into the cavity of the belly. However, if any thing still remain'd for a physician to do, that this ought to be attempted by internal medicines, and not by external applications. For as to letting blood from the hæmorrhoidal veins before the strength was broken down, that the patient had refus'd to comply therewith when he had desir'd it; and that now, in this state of weakness, there was no more room to think of it. That the patient had rejected every thing which had been previously applied to the tumour; not only as useless, but as heavy, and troublesome: wherefore avoiding every thing that might have the power of promoting suppuration, the *Ceratum Noribergense* was thought by him to be the most convenient application; but that we ought to depend entirely upon internal applications; that is to say, upon such as were strongly attenuating and dissolvent; such as would open the belly more than rhubarb; and still more, such as increas'd the quantity of the urine.

In order to produce these effects, having recommended a great number of remedies, and those of the more powerful kind, as his custom was; he also said that mercurials and chalybeates seem'd to him proper for the purpose, if they could be born by the patient, and were not disapprov'd by us, to whom he propos'd them.

After he had finish'd speaking, the physician, who had attended with him, said a few words on the subject, passing by other circumstances of the case, and only adding that he believ'd the liver and spleen to be obstructed besides; but in regard to the medicines, he differ'd far from the other; saying that he could not, in his conscience, propose any thing but rhubarb as a purgative; as this was the only one which he had before made use of without any inconvenience: whereas he had seen all the others which were added have the most disagreeable effects; not only by creating considerable uneasinesses for the present; but by injuring the health of the patient. Then one of those who had come with me, having spoken somewhat more at large upon the nature of the tumour, and its seat in the omentum, and upon the excrescence in the ring of the pylorus; which the former had spoken of and threaten'd, particularly approv'd of this opinion: but in regard to remedies, he differ'd from both of them. For he reject'd every thing that is call'd purgative, and even rhubarb itself: but propos'd a decoction of the woods, as it is call'd, with a small portion of the viper; unless this should seem to be too heating, on account of any feverish disposition.

23. I, however, altho' I said that there were four things which ought to be chiefly attended to by us, the tumour, vomiting, wasting of flesh, and fever; nevertheless commended those who had spoken before me, for having had a particular regard to the tumour, which, as it had been antecedent to the other disorders, might also seem to be the cause of them. I likewise said that the cause of the tumour might, certainly, be suppos'd to consist in the less quick

motion

motion of the blood thro' the vena portarum; which the patient's sedentary state of life, the hypochondriacal affection, and the flux of blood by the hæmorrhoids; that was of use at the time of its flowing, or returning, but hurtful when it decreas'd, or quite fell away; pretty clearly prov'd.

From this retarded motion therefore, that irritations, crispatures, and pains had arisen; and, finally, the beginning of a tumour, in some one of these parts, from whence the returning blood is to be receiv'd, into that vein. That there were other parts which transmitted their blood to the vena portarum, besides the omentum, and mesentery, but particularly the intestines; which were, in fact, more near to the hands of any person who touch'd the abdomen, than the mesentery itself; and not less moveable to one side and the other, than the parts of the mesentery annex'd thereto; and even much more so than those, in particular, that are nearest to its center.

To this, I said, we may might add that, on such a supposition, we could more easily account for, not only the long costiveness of the bowels, but perhaps, even the vomiting, which had so frequently been brought on. For that those small intestines, which lie in this region of the belly, being constricted, the diameter of the passage was not only diminish'd, and the peristaltic motion, in some measure, obstructed; but even that some part of the irritation would be propagated, without any difficulty, to the neighbouring stomach, into which they were continued. And indeed, that the pain which arose in that part, from pressing with the hand, or even from the inconvenience of flatus, would be much more clearly understood, if we should suppose the tumour to belong to the intestines themselves.

Nevertheless I desir'd I might not be understood, as if, by saying these things, I meant to prefer my opinion to that of others, as I would submit it to the consideration of all; since I would not pretend absolutely to determine on any thing, in an affair so difficult, and obscure: and therefore did not despise the opinion of others. For although I remember'd frequently to have read of large tumours in the omentum, without the mention of any pain (*k*); and had even determin'd, with the consent of others, a tumour to be of this kind which I met with in the wife of a physician, who was of a full habit, and of a good colour, and felt no inconvenience therefrom, not even pain when it was press'd; yet that there may be, sometimes, a tumour in the omentum of such a nature, hardness, and shape, that by pressing it, either in that part, or in the parts contiguous, a pain may be excited: of which circumstance I knew that some learned men had not doubted (*l*).

But as to large tumours of the mesentery, that they, by pushing the intestines, and the omentum to the sides, lie immediately under the anterior parietes of the belly, and are contiguous to them, may be confirm'd by more than one observation (*m*) of physicians, and anatomists. Moreover, that the difficulty of distinguishing the true situation of a tumour, was increas'd in

(*k*) Wharton adenogr. c. 12. vid. etiam suis locis pleraque observ. indicatas in hac Sepulchr. sect. 21. sub obs. 33. itemque in additam. obs. 73. 80, 85. 88.

(*l*) Vid. sect. modo cit. schol. ad obs. 54. & in addit. obs. 80. vers. fin.

(*m*) Vid. River. prax. med. l. 13. c. 5. Wharton. l. cit. c. 11; Scultet. armam. chir. obs. 62. & cæt.

bellies of this kind, which are fat, large, and subject to flatus and tormina of the bowels. For besides that a great quantity of fat, lying betwixt the hand and the viscera, is an obstruction to our examination, there are, frequently, in such bellies as these, viscera; and, particularly, some of the intestines; drawn, or forc'd, out of their situations. But as there may be more than one seat of pain, so that there may be more than one cause of a very obstinate vomiting.

Nor indeed did it escape me, that from the ring of the pylorus itself, a kind of excrescence sometimes arose, such as I had often seen; which, if it be pretty large in its size, as a certain steatoma was in a physician well-known to some of my friends, may prevent the passage of the aliments: yet that, at the same time, I was by no means ignorant how many causes there may be in that place, or near to that place, both internally, and externally, producing the same effects; so that if we even reckon up a great number, we shall perhaps not hit upon the true one. For, to mention one case by way of example; the coats of the stomach being, every where about this passage, grown hard, and thick, that the passage becomes much narrower than it naturally is; and the aliments are not propell'd; which kind of disorder had been found at Padua, in a priest; and not only in others of whom I had read in other places (*n*), as well as in the Sepulchretum (*o*).

And not to say that just the same effect would be produc'd, if any one of the disorders spoken of, should beset a part of the duodenum, that was nearest to the stomach (*p*): there certainly was an observation extant in the Sepulchretum (*q*), of a case not very much unlike this, if I remember'd rightly, whereof we were speaking; so that the question about the tumour of the omentum had recall'd it to my memory: for as the omentum had a large tumour in the epigastrium, of the hardest fat, the pylorus was so constricted by a similar matter, which lay around it, that from hence an incurable vomiting, an obstinate costiveness, and a wasting of flesh had been brought on.

Of this last mention'd symptom there was no occasion to say much, in regard to a patient, who not only threw up his aliments, but even a greater quantity of fluid than he took in: whether this water was from saliva, which often descended in great quantities into an empty stomach; or even was press'd out from the coats of the stomach itself, by the frequent strainings to vomit: although some part of the chyle, which was prepar'd from the very few ingesta that pass'd into the intestines, might, moreover, be intercepted by the tumour, which belong'd either to the intestines, or to the mesentery.

From this tumour, or at least on the account of this tumour, some particles that have stagnated long in the belly, and have, for that reason, become deprav'd, may, upon their return into the blood, have so irritated the heart, and arteries; that, finally, I was at liberty to conjecture the origin of the fever, in this, or some other similar manner.

From what I had hitherto said of the four articles propos'd to be consider'd, in the beginning; although it appear'd wherein I differ'd from the others; it was, nevertheless, easy to conceive that I could not but agree with

(*n*) Vid. epist. 30. n. 13.

(*o*) L. 3. f. 8. obs. 17. & seq.

(*p*) Vid. confirmatum epist. 30. n. 12.

(*q*) L. cit. f. 21. obs. 80.

them, in determining the disorder to be incurable. And this I readily confess'd : I only added this one thing, in particular ; that I was afraid lest the tumour might bring on death in some other way, rather than by an effusion of pus ; the signs of which were not, at present, very near at hand.

That it became us, therefore, in an incurable disease, to use all our efforts, that life might be prolong'd to as great an extent as possible ; by resisting, as much as it was in our power, the causes that might accelerate death. That in the number of these causes vomiting was to be consider'd, in more respects than one ; by bringing on a wasting, by diminishing the strength, by giving concussions to the tumour. And if the chief cause of vomiting could not be remov'd, yet that another might, at least, be diminish'd ; which, in some measure, perhaps exasperated the former, as it generally does ; that is the costiveness of the intestines. That the bishop was by all means to be entreated to suffer clysters to be made use of, which would have this effect ; or if they were administer'd without the desir'd effect, would, at least, serve for nourishment. But if he persisted in refusing to admit of them, and if rhubarb, in the method prescrib'd above, had really sufficiently obviated the costiveness, without any inconvenience, that I had no objection to the use of it ; not so much because I approv'd of it, as because other purgatives were partly not suitable to the case, and partly were evidently hurtful ; and that I was therefore induc'd, and compell'd, by the necessity of the case, to admit of it.

However, that all irritating and unpleasant medicines were to be avoided : and therefore I did not disapprove of a small portion of the viper ; which might, without the knowledge of the patient, be boil'd in broths, and administer'd by way of nourishment ; unless they should rather choose to dissolve some of the jelly of the viper therein : for that the heat of the viper could not possibly be of any disservice, in so small a quantity of either one, or the other, while the fever was thus slight ; nor even if it were so great as most of them seem'd to imagine. And that I said nearly the same things, of a proportionable quantity of sarsaparilla, or rather of china-root.

As to the proposal of giving mercury ; I said, in the first place, that the patient had not strength enough to suffer us even to think of it : and if he had, that I should much more readily approve of a small blood-letting from the hæmorrhoidal veins, as most agreeable to what I had said of the tumour : and in the second place, that if the nature of the tumour was such as they judg'd it to be, which I could not take upon me to deny ; I mean that it seem'd, to the touch, to be evidently made up of scirrhus, and strumous glands ; certainly mercury was less proper than millepedes : and that these were more proper, likewise, on account of its being probable that they would prove diuretic at the same time, if this effect were really of the importance that had been suppos'd. But that nothing was of more importance than to lengthen out life, as I had already said ; and that this might be brought about by omitting every thing that was distasteful, and giving such things as were more grateful, and nourishing. And that we ought diligently to attend to the manner in which the stomach is affected by these different things, in order to make the chief use of those which have been retain'd the longest, or not wholly thrown up.

24. Although I could not be so short in this case, as I generally am in medical consultations; yet the physician who spoke last made a still much longer harangue: he was an elderly man, and a celebrated professor. The amount of his speech was this; that he acknowledg'd the nature of the tumour to be the same as the others thought it: but he suppos'd it could have no other situation than that of the mesentery, the omentum (for of the intestines he did not say a single word) being put out of the question, chiefly for this reason, because it was without sensation, and could be cut into without pain. However, he confirm'd the opinion of the disorder being incurable: approv'd of medical aliments, and among these the viper in particular: he condemn'd purgatives, and all violent remedies: but not so millepedes; as he remember'd a poor girl to have been cur'd of a struma, by the use of them.

You have now, then, the summary of whatever pass'd in the consultation. But do not wonder that, although I have given, briefly, the opinions of four physicians, who flourish'd here, and were more eminent than others, at that time; I have, nevertheless, been more diffuse in explaining my own: for this I have done that I might be less prolix, in accounting for those appearances which were found in the body of the bishop, after death; which happen'd about the twenty-eighth day after our consultation. But let us finish the history of the disease that I had begun.

25. What the two physicians, to whom the cure had been committed, did afterwards, I never, in the least, inquir'd; nor indeed is it my custom, after I have given my opinion. Yet I heard, as did every one at Padua, that they had given rhubarb on the day following; but not within the former bounds; and, therefore, not without great uneasiness to the patient: and that, at length, they had persuaded the patient to admit of clysters sometimes; and, by this means, had procur'd stools with some advantage. Last of all, when it had happen'd that two days were pass'd over without any vomiting, I heard that expectations had been spread abroad among the populace, of the recovery of the patient; which I could wish had been accomplish'd; but from what source this prevailing hope arose, I cannot tell.

Soon after, however, I heard that the vomitings had return'd, and even in a more violent manner than before. In the mean while a foreign physician came hither, who was, in the opinion of the people, very excellent: and he, they said, had here pronounc'd this case to be desperate; but had added, in some other place, that he could have overcome the disorder by means of mercury, if he had come sooner. Nor indeed was one wanting, when he was gone away, who promis'd, without the least hesitation, to cure the patient by a certain remedy of his. This was an infusion of what is call'd the lignum nephriticum; wherewith he, perhaps, might have discuss'd some hardnesses of the belly, at Venice. He gave it several times to the bishop, but in vain. And now his wasting of flesh being increas'd every day, and his strength proportionably decreasing, the disorder hasten'd to its end:

At a certain hour the patient call'd out for more bed-clothes, as if he were cold; whereas, at other times, he could bear only the lightest coverings; that is by reason of the heat, but an internal heat: for externally, no person ever perceiv'd his body to be cold, or hot, but always gently warm.

His respiration was never bad. His pulse was neither hard, nor intermitting; nor ever, in any measure, unequal: but had become very frequent, on the last days of his life, and so low, that by one of the physicians it was suppos'd to be quite lost. To this was added convulsive startings of the tendons, and sometimes a very slight delirium. On the same last days, the vomitings still continu'd; but the matter discharg'd was bitter, and smelt very strong; and was so very black that some thought it to be blood: but a piece of paper, that had been dip'd into it, appear'd, after drying, to be of a dilute yellow colour, inclining to green; which shew'd the humour discharg'd to be bile. In this manner the patient struggled on to the twenty-third day of June; on which day, in the afternoon, he was attack'd with so very violent a paroxysm, that it was suppos'd he would have instantly died. Nevertheless he escap'd. But the same paroxysm returning, on the following day, at the same hour, this excellent prelate; being perfectly in his senses, and every now and then pronouncing some pious words, with a low voice; having turn'd himself to one side, without any assistance, which on the former days he could not have done; soon after departed this life in a placid and serene manner.

26. As the body was to be embalm'd in the evening, in order that the funeral rites might be perform'd on the third day after, all of us, who had given our opinion on the case, were call'd to the operation. And there, after having heard from the physicians of the bishop, and his household-priests, those things that I have related to you as undoubted facts, concerning the latter part of the disease, I presently after presid'd at the dissection, while I was surrounded by my fellow-physicians, and a great number of students. The abdomen, although the limbs and the face had been much more extenuated, than this part; had, nevertheless, so far subsided, that, even from this cause, it might be suppos'd the tumour had risen up, and become protuberant, outwards, more than we had seen it before. Nevertheless, under the skin of the abdomen the fat was, universally, two inches thick.

The cavity of the belly being laid open, into which a bloody serum had been extravasated, to the quantity nearly of three pints, two circumstances drew the eyes of every one upon them at once. For, on one hand, appear'd the tumour, of which there had been so much controversy, in the form of a large globe; or rather like a large hemisphere; having the resemblance, if you attended to the colour, the foetid smell, and the inequality of surface, of a most foul cancer. And, on the other hand, which was a very strange, and unusual spectacle, the whole of the space contain'd within the belly, from the navel downwards, was, universally; if you except the left and inferior part of the colon, and the rectum, with that part of the mesocolon belonging thereto, and the urinary bladder; entirely free from viscera, and empty. And from hence it came immediately into my mind what the tumour was: and this suspicion was confirm'd, first, by my own inspection; and then by the inspection of every one. That is to say, the whole intestinum ileum, and some part of the neighbouring jejunum, having left their situations, which are, naturally, below the navel; and being drawn upwards, and join'd together very closely, had, of themselves, compos'd this large and prominent tumour, without the least addition of any scrophulous, scirrhus, or cancerous substance.

For the inequality of the surface arose from those frequent flexures of the intestines, and their unequal position, and constriction; so that they protuberated more in one part, and less in another: but the blackish colour, which was almost universal; I mean which had only some lesser spaces interpos'd that were still red; was manifestly owing to the inflammation of the intestines, which had already degenerated, in great measure, into a gangrene; doubtless from the return of the blood into the vena portarum being, at length, intercepted; the retardation of which I have spoken of above (*r*): and, finally, the ill smell was the consequence of the gangrene, as it naturally is. The intestines of which the tumour was made up, were almost full of matter, like the stercoraceous matter generally contain'd in the large intestines, and not very soft, as we found by laying one of them open afterwards; so as to make it evident that the matter which naturally descends speedily into the large intestines, being obstructed, and having flatus join'd to it, the tumour might give that resistance to the touch, which we had perceiv'd in the living body.

And, although by reason of the close connexion of the intestines one with another; which I mention'd before; there was occasion to take a very long time to separate them by means of the scalpel (for drawing them on one side, and on the other, with the hands, was of no effect) yet about the middle, and almost the upper part, of the tumour, the separation being less difficult, it was brought about in this part, at least, and the interiors of the tumour brought to view; which were, in like manner, made up of intestines heap'd together beneath, and, in some part of the mesentery, which was neither grown hard, nor thick, nor of a black colour, that any of us could distinguish; but perfectly sound, and fill'd with fat; which was, as it naturally is, of a white colour, inclining to yellow.

As the omentum had not appear'd, in any degree, hitherto, I turn'd my eyes to the upper region of the belly; where the stomach was sunk down betwixt the describ'd tumour, and the diaphragm: and as it did not very well appear, even by these means, but seem'd to be a kind of hard, thick, and heavy band, fixing itself closely to the fundus of the stomach, and the intestine colon, that lay beneath the stomach; passing transversely from one hypochondrium to the other; and depressing both the stomach, and this large intestine, by its weight, and thickness; I was, at length, scarcely certain that it was really the omentum, till it had been confirm'd by the others, as well as by myself, from the due consideration of all circumstances.

For the small intestines, rising into a tumour, had long ago driven the omentum up into that part; and there, being folded up together, it had coalesc'd into one hard body, like a fascia, or band, of an equal surface, but not of an equal thickness. For, in some places, it was of the thickness of one inch, in others of two, and in some again of three; as was clearly perceiv'd by the sections: but the greatest thickness was observ'd to be near the spleen in particular, as a rigid hardness was also; so that when it was cut into, the substance thereof grated under the knife: however, to the sight the substance was every where uniform; but the hardness was, in some places, of the ligamentous kind as it were, and, in others, almost cartilaginous.

In this state then was the omentum ; which did not fall under the notice of the touch in the living body : inasmuch as lying betwixt the great quantity of fat of the abdomen, and the yielding viscera, the stomach, and the intestinum colon ; and by reason of its depress'd situation, and its very firm connexions ; it could neither be laid hold of betwixt the hands, as that prominent tumour of the intestines could be, nor mov'd to which-ever side you pleas'd. The stomach was then examin'd. And after having exhausted all the contain'd fluid ; which was in great quantity, of a blackish colour, had a very filthy smell, and was, in every respect, such as had been thrown up in the last vomitings ; the internal surface of it appear'd of a reddish colour, inclining to brown ; which, perhaps, might be the consequence of being ting'd with the humour I have describ'd ; or might possibly be the effect of inflammation.

But in the antrum pylori, it seem'd, here and there, distinguish'd with certain small coagula of blood, as it were ; which, when more accurately examin'd, were found to be nothing else but small and depress'd tubercles, internally, indeed, firm and white, yet, on the surface, affected with a gangrene : some of them were of an oval figure, and others had different figures and positions ; but the greater part were made up of many, in such a manner as to resemble branching asterisks, as it were, or asterisks furnish'd with inflected and bifurcated radii. Yet the more near they approach'd to the pylorus, from the beginning of the antrum, the smaller and less frequent did they become, so as at length to be quite solitary. That which was the largest of all scarcely reach'd the magnitude of a bean.

In the pylorus itself, neither these tubercles, nor any excrescences, were observ'd : and, indeed, the passage through this part was not so much contracted, as to prevent a finger being introduc'd into it, according to my desire. Yet there were in this part, and in almost the whole antrum of the pylorus ; and, in like manner, in the first part of the intestinum duodenum, which was nearest thereto, so very thick and hard coats, that, as they equal'd the point of the finger in thickness, so they did not yield much, in rigid hardness, to the omentum that I have describ'd ; to which they were likewise similar in their hard and compact substance : and from this very substance, rising up into little prominences, in some places, those tubercles were form'd, which I spoke of before.

The liver was internally and externally pallid, and somewhat hard, but of its natural figure and size. The gall-bladder contain'd a bile like a blackish mud. The spleen, and the other viscera, were found, as those of the thorax also were ; where the pericardium and the heart were seen to be cover'd over with fat. One viscus of the belly, however, must be excepted ; and that is the pancreas : but as I was about to proceed in my inquiry into the state of this viscus, my colleagues began to be tir'd ; and to think, as the night was now far spent, and the smell extremely offensive, and as these very firm connexions of the omentum could not very soon be dissolv'd, in order to lay bare the pancreas, that the dissection had been sufficiently prosecuted.

27. And, indeed, if you attended to what had preceeded, especially to the tumour ; on the particular nature and situation of which the controversy had been agitated during the life of the patient ; the inquiry seem'd to be carried sufficiently

sufficiently far. And as I was returning from the dissection, together with my companions, being ask'd by a very grave man, what appearance had, at length, been found; I immediately answer'd, for all of us, nothing but what had been previously hinted, in some measure, in our consultation, and justly pronounc'd incurable. Nor did I conclude the narration in any different manner, when I wrote to that eminent senator, spoken of above (*s*), brother to the bishop; when, on the day following, I sent the summary, of what had been observ'd, to him, as my duty and respect oblig'd me: and this, as it was acceptable to him, he kept by him.

Nor, indeed, although I afterwards heard that one, and another summary, of these things, was in the hands of every one, would I, for that reason, give out mine; as well because they were much more different from one another, than they were from mine, as because I was never willing to begin unnecessary controversies. And what could be less necessary, than such as could be determin'd by the testimony of the surgeons who had perform'd the dissection? And this I took care to procure when the subject was quite recent; not in order to produce it then, but only to have it at hand, as I actually have, if, at any time, I should produce the whole observation; and any one should be in doubt about the strict justness of my narration, from having perus'd any part of their summaries, which was somewhat different.

But I shall not now say what was wanting in these summaries, or what was superfluous; or, finally, what was different from the truth: nor, indeed, should I have made any mention of them, if I had not suppos'd that they had, probably, been seen by you, some time or other; and that you would wonder at my taking no notice of them. I shall only tell you this that was then said by all the others, who were present at the dissection: that one physician very properly confess'd the tumour, upon which there had been so much controversy, to consist of the small intestines join'd and heap'd up together into a large globe; but this was said without justice, that it had also consisted of "the mesentery, which was become very hard, and of the same colour" (that is to say, "black and gangrenous") with which the intestines were ting'd; and, finally, that it was "tumid."

So also, on the contrary, I will say that another of them, with justice, affirm'd the mesentery to be "white, and without any tumour, or hardness;" but those things were not said with propriety; when forgetting that he himself had, in the consultation, conjectur'd a scirrhus of the mesentery, as well as of the omentum (*t*), he carp'd, not without some severity, at him who had suppos'd a scirrhus in the mesentery; and, in like manner, where he discours'd upon the coalition of the intestines, and the scirrhus of the omentum, with such artifice, that any one, who was ignorant of the affair, would not so much as suspect the intestines to have been heap'd up into one globe, and to have risen up into a tumour; but would suspect, for this reason, that the tumour in question had been made up, chiefly, by the scirrhus of the omentum; nay, would even certainly suppose, that this tumour was nothing else but the scirrhus of the omentum; which did not, however, begin "in the upper part of the navel," but much higher; nor was in the least elevated, but lay quite smooth and depress'd.

How much more would it have become those two senior physicians, to have given up all controversy upon the situation of the tumour; which could now exist no longer with any propriety; and imitate the illustrious example of Hippocrates (*u*), and Galen (*x*), by candidly confessing that they had been deceiv'd in their conjectures, on the nature thereof; since it was not very pleasing to me, who was the only one that had hinted at the real seat thereof, not to have been able entirely to avoid a tacit suspicion of having been deceiv'd, in regard to its nature, in common with the rest; but still less so, to have had this suspicion spread openly among the people.

28. It is of great importance for those who are given to the study of medicine; and of a great importance to you, on whose account I have undertaken this long discourse; not to be ignorant that a tumour once existed in the belly, which; although it was made up of the intestines themselves; being, nevertheless, of an unequal and tuberosus surface, and giving considerable resistance to the touch, had impos'd upon five physicians; and those, if you except me alone, very sagacious, and experienc'd men; under the appearance of a scirrhus. And who can inquire into the marks by which this disorder may be distinguish'd, unless the disorder be made known by our ingenuous confession? Nor, indeed, will these signs be easily found among our authors; since I do not remember to have read a history any where that was perfectly like this.

I have read, indeed, in the acts of the Cæsarean academy (*y*), "that all the intestines were found to be closely cohering to each other;" or "the small intestines in particular, so very closely grown together with one another, and with the mesentery, every where, that" they made up "one mass, or one conglomerated heap," therewith: and indeed I have read that, in a young woman, who had been frequently subject to pains of the belly, the celebrated Fañtonus found (*z*) "almost all the intestines gathered up into one conglobated body, as it were, and very closely conglutinated with each other: and you may read in this twenty-first section of the Sepulchretum (*a*), "that all the intestines were conglomerated, and form'd into a kind of globe:" and, in like manner (*b*), "that the intestines were so drawn up to the superior parts, as scarcely to fill half the capacity of the abdomen."

But in none of those observations will you find that they were so drawn up, and conglobated, as to be externally prominent in the form of a circumscrib'd and particular tumour: and in the two last this even could not have happen'd, as the bodies were in a dropical state, and a great quantity of water was interpos'd, so as to distend the whole abdomen: as it likewise could not happen in another dropical woman, in whose body Thomas Bartholin (*c*) saw "all the intestines thrust aside to the right hypochondrium; so that, at first, they seem'd to have been wanting;" or in a soldier, who, also, had labour'd under an ascites; whose intestines Laubius (*d*) found "surprizingly intwin'd, and collected together, into one globe, as it were, towards the navel."

(*u*) Epidem. l. 5. n. 14.

(*x*) De Loc. aff. l. 2. c. 5.

(*y*) Tom. 1. obs. 87. & tom. 6. obs. 134.

(*z*) De observ. med. & anat. epist. 4.

(*a*) Obs. 3. §. 8.

(*b*) Obs. 20. §. 6.

(*c*) Cent. 1. hist. anat. 2.

(*d*) Eph. n. c. cent. 9. obs. 64.

And this, perhaps, might have been the case; though it is not expressly said to have been so; in Cardinal Campegio, in whose body “all the intestines” (part of the colon and the rectum ought to have been excepted) “were forc’d together into the hypochondria; for which reason the inferior cavity of the abdomen was destitute of intestines, and the spine uncover’d,” as Columbus saw (*e*); “the novelty of which circumstance,” that was also seen by us in the bishop, “could not,” says he, “be sufficiently admir’d by the excellent Augustino Ricci of Lucca.”

A still more surprizing novelty of this kind, I afterwards met with in a female foetus. For upon opening the belly, and wiping away the blood that was extravasated therein, no intestine, beside those that I just now excepted, was any where to be seen; as all the others, with almost the whole of the mesentery, lay hid under the concave surface of the liver; and were confin’d in such a manner, as I shall, perhaps, explain to you on a more convenient occasion (*f*). But this nobody could have suspected before dissection; because, by reason of that quantity of blood being extravasated, the abdomen did not subside, below the navel: and if it had subsided, who would not have imagin’d that it was to be imputed to the liver, which is always large in a foetus, being, perhaps, much enlarg’d here, rather than to the intestines being drawn up behind the liver?

For Philip Jacob Hartmann (*g*) had, indeed, also seen a large tumour, in a girl of three years old, stretch’d out from the left spurious ribs, to the confines of the pubes; nor could he possibly have suppos’d it to be made up of “the intestines coalesc’d into one body, with the greater part of all the mesentery;” so that “the back was the only part which lay conspicuous to the sight:” yet he has not added any thing, whereby, if the same should happen again, the nature thereof might be known. Columbus, however (*h*), had intermix’d some things, from whence we might collect a few marks to distinguish it by. “Wherefore,” says he, the physician, when examining “the belly of the cardinal with his hand, might plainly feel the motion of the great artery; and together with that, perceive a hardness; which hardness was nothing else but the bodies of the vertebræ.”

These marks it was not in my power to make use of in the bishop, as I did not examine his belly below the navel; for the reason I have given you above (*i*): and even if I had made this examination, I suppose I should have perceiv’d neither of these marks; by reason of so great a quantity of fat being interpos’d; or, at least, not the motion of the great artery; or of the beginning of the iliacs; as the pulse was neither strong, nor large: for which reasons neither the physicians, nor the patient, seem to have observ’d it; as they, otherwise, would not have denied that any thing preternatural was perceiv’d below the navel.

But in those wherein the abdomen has less fat, these marks will not be without their advantage; provided there is some fat, and no suspicion of the great artery being dilated in that part, or pulsating immoderately, from any other cause: for in these cases, not only the pulsation of this artery is perceiv’d, even when the intestines lie betwixt, as is shown in this letter (*k*);

(*e*) De re anat. l. 15.

(*h*) Loc. citat.

(*f*) Vid. epist. 67. n. 17.

(*i*) N. 21.

(*g*) Eph. n. c. dec. 3. a 9. & 10. obs. 105.

(*k*) N. 19.

but the hardness of the vertebræ also; as I have said in another (*l*). In a body, therefore, that is neither fat, nor very thin, nor liable to these suspicions, if a pulsation be perceiv'd; and still more, if that hardness be perceiv'd at the same time; we shall conjecture the intestines to be drawn upwards: and it will add no small weight to the conjecture, to find that the abdomen is more depress'd below the navel, than it ought naturally to be; and more turgid above at the same time.

But if, together with these signs, a peculiar and moveable tumour arises in the upper region of the abdomen; such as has been describ'd in the bishop while living (*m*); we must not only take care, lest, by reason of the resistance, and inequality, or tuberosity, of surface, we readily refer it to the class of scirrhus, or strumous tumours; but we must, moreover, inquire by what symptoms we may rather be induc'd to suppose that it is made up of the intestines. These symptoms will be, if we find that the patient had been frequently subject to pains of the small intestines, and to a flux of blood from the hæmorrhoidal veins; although it has been afterwards diminish'd, or suppress'd; if the tumour be affected with pain, when the intestines are troubled with flatus; if the bowels have become more and more costive, from the time the tumour began; and other things of the same kind; which are either read in the history I have given you, or may come into your mind from reading it.

Yet these would be more peculiar marks, if the tumour should be observ'd by the patient, or by the physicians, to be sometimes more considerable; and, at other times, more slight; harder or larger; softer or less; as happens in intestinal hernias. And though it seems that this could happen very seldom, in such a tumour as the bishop's, by reason of the very frequent flexures, the considerable constriction, and the very close coalition, in particular, of one intestine with the other, being injurious to their peristaltic motion; which causes, for instance, obstruct and retain in them, as I have seen, the matter from whence the resistance arises; yet it is natural to suppose, that if the enquiry be made accurately, and at repeated times; and, particularly, when either no excrements have been discharg'd for some time, or a great quantity has been lately discharg'd; or when the patient is troubled with a large or small quantity of flatus; it is natural to suppose, I say, that some one of these signs may be in some part found.

These then are, in general, the remarks that came into my mind when I was thinking of this tumour. Others will add different signs; and you, in consequence of your ingenuity, which is well-known to me, will add better. And that you may do this the more easily, I will subjoin another observation (although complicated with various disorders; and perhaps not very accurately describ'd, as I did not see the patient myself) which in some measure relates to tumours of this kind; but, at least, relates to the subject of this letter, and to the lower region of the belly; which, as the order I propos'd to myself requires, comes now to be consider'd.

29. A monk of the monastery of St. Francesco, which is in the place of my nativity, having symptoms of a slight ascites, seem'd to have been sud-

(*l*) Epist. 10. n. 12.

(*m*) Supra. n. 19.

denly emptied in the abdomen, by copious vomitings; except that in the hypogastrium, a tumour appear'd of such a hardness, as to make those who attended him suppose it to be scirrhus. When this tumour was compress'd with the hands, flatus was forc'd out from below. The vomiting continued; to which a constant and incredible nausea being added, and an insuperable costiveness, at length the intestinal fæces, or, at least, a matter very similar thereto, began to be thrown up. Therefore, although no pain in the belly, no signs of inflammation had come on, the patient was, nevertheless, carried off by the disease.

While he was at the point of death, his physician, who was a man of eminence, coming to me to beg of me to preside at the dissection, on the day following, if it were convenient for me; and having related to me (who was then confin'd to my bed with a slight fever) what I just now told you, I said to him, I beg of you yourself to preside; for you can do it extremely well; and as you have inform'd me of the symptoms which had preceded, I should be glad to be inform'd, likewise, of the appearances you find: for what I have heard from you of the ascites, the tumour, and the flatus being forc'd out when it was press'd; and, finally, of the ileos; seem to me to argue a cohesion, and some entangled state, of the intestines. And on the following day, which was the sixth of November in the year 1709, having very obligingly return'd to me, he said, in the following manner did we find the appearances.

When the belly was open'd the intestines were found to be very livid, but not putrified. The small intestines, in a certain part of them, being surprizingly entangled with each other, and join'd together by connexions made up of a firm and dense substance similar to a tendinous, and, indeed, almost similar to a cartilaginous substance, compos'd that tumour; which was render'd so hard, not only on account of this interpos'd and connecting substance, but also on account of the fæces, with which they were fill'd, being form'd into a kind of small globular bodies. Globules of this kind were not only in that part, but also in the neighbouring intestine colon; till at length it became impervious for some extent, not long before it terminated in the rectum; in which tract, when we cut into it, we found it to be made up, not of whitish, but entirely of fleshy fibres. The stomach was internally livid to a small degree, and full of a fluid of the same colour.

30. You see that another physician, and an eminent man likewise, was deceiv'd in the same manner, and for the same reason. And his observation, if it had been in my mind eighteen years after, as it was then remark'd, might have been useful, without doubt; not only to determine the situation of that tumour, which I have describ'd to you at large (*n*), with somewhat more confidence; but also to conjecture the nature of it with much greater justice: although in the monk it was much less, and not so prominent, nor moveable, as far as I know, nor attended with any pain; and the discharge of flatus from below had follow'd the pressure of it in the beginning; whether the intestine colon had not yet entirely coalesc'd, or whether the extreme circular part of it, which was kept open, lay under the tu-

(*n*) Supra n. 19.

mour in such a manner, that when the tumour was compress'd this part was compress'd also.

To these were added other different circumstances; in particular the hardness which lay betwixt the intestines, and the foregoing dropfy of the ascites kind: and from hence it was, join'd together with other tokens, that I suspected some cohesión, as I have said (*o*), of the intestines. For, in the first place, I had seen, in the year 1699; when Valsalva open'd the abdomen of a woman, who died of an ascites, in the hospital of incurables at Bologna; the intestines adhering, almost every where, with the peritonæum; but particularly to one another, in a very great degree; so as to be almost grown into one substance; being connected, in the greater part of them, by a kind of cartilaginous substance; which, in some places, but chiefly about the colon, was equal to an inch in thickness.

In the second place, I had read Ruysch (*p*) taking notice of the intestines, in another woman, who died of the same disease; "not only as being grown, every where, to the peritonæum, but to each other also." And I had heard from Valsalva, that, in one who, like this monk, had labour'd under a foregoing dropfy, the intestines were connected one with another; as you have it in the history of a person that I have describ'd to you on a former occasion (*q*). And you will, likewise, find in another letter which I have sent you (*r*), that in a man whose belly contain'd a great quantity of water, I had seen the intestines already join'd to one another, by a kind of flaccid membranes, as it were: and these, probably, were the first beginnings of the cohesions; which, when the water is discharg'd, become more firm; and continue afterwards, even when the water, as frequently happens, is collected again: and I think I have sufficiently shown you already (*s*), what the matter is, from whence membranes of this kind have their origin.

In regard to this connection of the intestines; although I see that men of great eminence have the same opinion which I have; I do not, however, think, that they always cohere together in this manner; but in different ways also; which I took notice of, when I wrote to you (*t*) upon the adhesion of the lungs to the pleura, or of the heart to the pericardium. And, indeed, where the coalition is brought about in consequence of inflammation only; by which, to use the words of Ruysch (*u*), "we see that the viscera are often drawn together, and united to one another;" there are different modes of explaining, and accounting for, the union; that is to say, whether you follow, with most others, those who consider the dryness of the surfaces that are contiguous to each other; or those who attribute it chiefly to the viscosity of these surfaces, from an increas'd perspiration of humours; which, as they might have added, the retarded motion of the blood renders more viscid.

But as Crellius (*x*), that author whom we lost by an untimely death, has receded from the first, and even the second, mode of explication, not without assigning a reason for his dissent; it is necessary to attempt the ex-

(*o*) N. 29.

(*p*) Obs. anat. chir. 45.

(*q*) Epist. 17. n. 17.

(*r*) Epist. 10. n. 13.

(*s*) Epist. 20. n. 37.

(*t*) Epist. 16. n. 15; epist. 18. n. 15, ep.

23. n. 17.

(*u*) Obs. cit. 83.

(*x*) Dissert. de viscer. nexib. insolit. n. 14.

planation of this appearance in a different manner. But not to quit the subject of the dropsy, it is also very easy to conceive; as the same author has acknowledg'd (*y*); how a coalition of the viscera may happen in that disease, if the water, in which they are macerated, be of a more acrid nature than usual, so as slightly to erode the surface of them. And what must be the consequence where it is purulent, as it was in one of the two observations, which I took notice of above (*z*), from the Sepulchretum, wherein the intestines were found to be drawn up to the upper parts? And signs of erosion were not wanting even in the other, in which the intestines of a dropical woman were seen to be roll'd up into one heap, and made into a kind of globular figure. You see then, by how many observations I was induc'd to suspect, that there might be some cohesion of the intestines; when I heard that, besides the other marks, there had been an ascites.

31. But as the intestines may cohere with one another, and, without leaving the situations in which they are naturally plac'd, be heap'd up together; so that, lying one over another, they may form a tumour, or a kind of globe; if you enquire after the causes of this conglomerated state; I do not know whether any one more probable can be thought of than pains: by the force of which, the seats of the intestines may be chang'd, as well as cohesions be brought on. And that the situations are frequently chang'd, in those who are subject to pains of the intestines, is shown, in a former letter, from observations of bodies of this kind (*a*): as when the included flatus forces the distended colon to some other part of the abdomen, or disturbs it in its natural situation: which cause, if transfer'd to the small intestines, will help you to conceive, in what manner some tracts thereof, which are dilated, may raise themselves up into that part, where they were not before, and thrust to one side, and even force beneath themselves, those tracts which naturally lay in that situation.

Add to this the motions of those parts of the intestines, which are tortur'd with convulsive contractions, in consequence of pains: add the contractions of this kind in the mesentery; by which being crisp'd up, it may either draw to itself some of the annex'd intestines, or most, or all of them; and it will appear much more clearly, how they may be forc'd together, into globes of a smaller or of a larger size. And if they be retain'd in their new situation, for a considerable time, by these causes that are mention'd, and are press'd one against another; it will appear, at the same time, why they there begin to cohere with each other, on account of the pains; especially if you consider that many, and very viscid, particles of humours, which stagnate there, are press'd out from their surfaces by the same contractions: by means of which particles; particularly in bodies that abound with viscidities; the same surfaces may be join'd together, as if by a kind of gluten.

Nor, indeed, is it any new thing that the intestines should be connected, and conglutinated, in consequence of pains. For thus, not to lead you too far from the Sepulchretum, in a woman who had been carried off by long-continu'd tortures of these viscera (*b*), they were found to be "connected

(*y*) Ibid. n. 12.

(*z*) N. 28.

(*a*) Epist. 34. n. 4.

(*b*) L. 3. sect. 14. obs. 16. §. 4.

“ to each other, in many places;” and in another, who had died after “ very great, and incredible” pains of the belly (*c*), the observator found “ all the small intestines, which protuberated, connected very closely with each other.”

And if you understand this word *protuberated* in such a sense, as to signify that they were heap’d up together, into one prominent globe; and in the same manner that I have related above (*d*), from the observation of Fantonus; “ roll’d up as it were into one globular body;” you will perceive that they were found to be connected, and heap’d up together, at the same time, in consequence of pain, just as they were found to be, by us, in the bishop (*e*): although in these other observations, a peculiar, and externally circumscrib’d, tumour is not spoken of; and in one of them, could not have existed; as in that case a large quantity of bloody serum, that had been extravasated, distended the whole abdomen. And although the monk was not so excruciated with pains (*f*), as the bishop was; yet I do not, for a certainty, know that he had been free therefrom before.

32. But as to his not only having, like the bishop, the intestines conglutinated, but connected, to one another by a kind of cartilaginous substance; this is neither surprizing to me, who have likewise seen the same thing, in conjunction with Valsalva, after an ascites; as I have already said (*g*): nor am I ignorant that the peritonæum itself, the production of which composes the external coat of the intestines; may become very thick in dropical bodies; and even “ in process of time acquire a cartilaginous hardness;” according to the observation of Paul Barbette (*h*); who puts us in mind of this, as “ necessary to be known in the paracentesis of the abdomen.”

But that the intestines are sometimes connected, by hard bands of this kind, even without an ascites, we learn from the observation of Saporiti in Valisneri (*i*). “ We found,” says he, “ the large intestines, particularly where they are reflected, in the neighbourhood of the duodenum, consolidated, by means of callous protuberances, with each other, and with the adjacent intestines; so that it was difficult to distinguish the one from the other; and what was worse, their substance so concreted, like a hardish cartilage, and thicken’d, that scarcely any cavity remain’d.” A substance, and contraction, of which kind, Ruysch (*k*) found in the intestine rectum; when he was oblig’d to divide it from the os sacrum, with an iron wedge, and a wooden mallet.

But Benivenius (*l*) appears to have found the same disorder of the intestines, after death, formerly, which he had been before sensible of in the living body; when a kind of hard substance made a resistance to his pressure upon the belly. And Donatus (*m*) produces another observation from Hollerius, and Stalpart (*n*) different ones from different authors. And as in this author (*o*), examples are pointed out of the same kind of coalition also; and such as

(*c*) Sect. 21. obs. 41.

(*d*) N. 28.

(*e*) Supra n. 26.

(*f*) N. 29.

(*g*) N. 30.

(*h*) Anat. pract. l. 4. c. 2.

(*i*) Opera tom. 3. p. 3.

(*k*) Obs. anat. chir. 95.

(*l*) De abdit. morbor. &c. causis c. 34.

(*m*) De medic. hist. l. 4. c. 10.

(*n*) Cent. 1. obs. 56. & in schol.

(*o*) In eod. schol.

might be refer'd to that which I have said was found at the extremity of the colon in our monk; and as other instances are, moreover, extant in the Sepulchretum (*p*); I will add nothing else, unless, that there was this peculiarity in the monk; I mean that, in the part just now mention'd, the colon seem'd to be made up entirely of fleshy fibres: which might be suppos'd to be the effect of redness from a preceding ulcer. And if this supposition is just, then he could not have been without previous pains of the intestines, according to my conjecture.

But now let us come to tumours of the viscera of a different kind.

33. A woman, seemingly, not much less than forty years of age, had already labour'd, a year before, under a uterine hæmorrhage. This was succeeded by a uterine fluor; but of what colour, or smell, is uncertain: this, however, is certain, that it was attended with very severe pains of the hypogastrium, and of the parts that lie beneath; particularly in the night time; and with a tumour, into which alone she said some tubercles, that could formerly be perceiv'd to be scatter'd in the middle of the hypogastrium, had coalesc'd. This tumour was now in that very situation; yet ascended so high as to be scarcely distant from the navel by the breadth of two fingers; being wide in proportion, and so prominent externally, that it was very apparent to the eye, even at a distance; was roundish in its figure; equal in its surface; and, if you touch'd it, gave resistance.

A constant dripping of urine had come on, a spasmodic pain in the throat, a nausea, and sometimes a vomiting; a wasting of flesh, and a fever. With all which disorders she was so weaken'd, and broken down, about the beginning of the year 1741; when she came into the hospital at Padua; that she died within six or seven days: nobody doubting but she died of a cancerous tumour of the uterus. And, indeed, a cancer had in part eroded the uterus; but the tumour did not belong to that, as I found by dissection, and demonstrated to a great circle of doctors and students.

For when the belly was open'd, it immediately appear'd, that the bladder, distended with urine, had made up that great tumour; a circumstance which nobody would have thought of; her urine having continually run from her, as I have said. This receptacle had coalesc'd, on its anterior surface, high above the pubes, with the parietes of the belly: and, if you except a considerable space of the same anterior surface, and of the upper part of the fundus, it had all its remaining parietes compos'd of a hard and white substance, of the thickness of a finger: as we saw plainly, after drawing out the urine; a great quantity of which it contain'd; not in a lixivious state; not thick; not of a disagreeable smell; but almost watry.

The internal surface of the bladder was found, only distinguish'd, in some places, with small sanguiferous vessels, which were scatter'd here and there; so that the orifice of the bladder, at which part they are frequently very thick, was entirely without these vessels. On each side of this orifice, within the bladder, a white body was prominent, of an irregular figure; equal in size to a man's thumb, and produc'd from the substance which surrounded the urethra; which substance was here universally become thicker, hard, and

white: and of this colour the urethra itself also was internally. Moreover, the whole of that part of the ureter, which is carried betwixt the membranes of the bladder, was more prominent than natural within the bladder, till it terminated in an orifice much larger than the usual one: this appearance was on both sides, and both the ureters were universally dilated; one of them being full of urine, and the other almost full of air. But even the tubuli of the kidneys, and the pelvis on both sides, were dilated, though the kidneys were in other respects found.

Having examin'd the urinary organs, we look'd over the genital parts. And, in the first place, we found both the testes, very closely connected to the parietes of the pelvis; and both of them of a white colour: the left of which was equal to the size of a large chestnut, and the right to that of a small nut. The latter of these contain'd a small quantity of water, perhaps within some kind of vesicle; being in other respects white, as externally, and hard: but the left had nothing under its coat, except a soft and white matter like suet.

The uterus, however, if you consider'd the fundus of it, was externally white, and smooth; and internally found in its parietes; except that these were more soft than they are naturally. But the external surface of the cervix was unequally turgid on the back-part: and the cervix itself, and the vagina, from the upper part almost to the lower, were made up of very thick, white, and hard parietes; the internal surface of which, and the osculum uteri itself, were eroded, and destroy'd with deep, and discolour'd ulcers. For they were white in some places; of a black bloody colour in others, and in some cineritious. And from all of them a putrid matter, ting'd with these colours, was easily rub'd off with the handle of the knife; till we came to the hard and white substance whereof I said that the parietes consisted; into which kind of substance, also, whatever is wont to be of a pinguedinous and membranous nature, at the sides of the vagina, was converted.

But, although both the bladder, and the substance surrounding the urethra, had been so chang'd, as I have said, on the anterior surface of the cervix, and vagina; yet the intestinum rectum could be separated from the vagina; which was, in other respects, much more ulcerated than the cervix uteri; without being injur'd. And in the whole of this dissection, no very disagreeable smell was perceiv'd. To inspect the other viscera was not necessary; nor, indeed, had we leisure. However, in the abdomen nothing, besides these parts, appear'd to be evidently morbid; though I observ'd the stomach to be very much contracted; and all the intestines to be more contracted than usual also: neither of which appearances is to be wonder'd at here, in a woman who scarcely took in any food by reason of her nausea; and sometimes threw it up again, as I have said, when it was taken in.

34. This observation may, in many respects, be very useful by rendering physicians cautious. For who, after having heard that one tumour was made up of tubercles which formerly lay at a distance from each other; and that this tumour was join'd with marks of a uterine cancer; whether he attended to the present, or the foregoing symptoms; would not have thought that it was a tumour of the uterus itself? Yet this tumour did not relate to the uterus, but to the distended bladder; which, by forcing the neighbouring intestines

testines upwards, while it began to raise itself higher, and, by compressing some parts of them, perhaps gave that appearance of divided tubercles.

Who, in like manner, that had been inform'd of the urine dripping away from her constantly, instead of being retain'd, would have suspected what was really the case, that a great part of the urine, nevertheless, still remain'd in the bladder; and, by the dextrous introduction of the catheter, might have been drawn off, at least, in part, to the great alleviation of the miserable patient? For as to Ruysch finding (*g*) that fullness of bladder, at length, in a lying-in woman, who likewise believ'd that she had no urine in her bladder, notwithstanding it was distended with a great quantity, in consequence of being deceiv'd by a similar stillicidium, as it seems; it is very certain that there was not the least sign in that woman, of a diseas'd uterus, to which the tumour of the belly could be refer'd. And, indeed, in another woman (*r*), who had some symptoms of the uterus being pregnant with a foetus, nobody refer'd the tumour of the belly to any other part but the uterus, though it was, in fact, made up of a large abscess, form'd betwixt the anterior coats of the bladder.

When, therefore, there is a tumour of the hypogastrium in women, although marks of a diseas'd uterus may not be wanting, a suspicion of the bladder, which is situated before the uterus, ought not, by any means, to be intirely pass'd by: nor are we to take for granted, because they say that their urine is continually running from them, that no part of it, for that reason, remains: nor, finally, although it is certain, that the vagina is ulcerated, together with the uterus, are we always to conclude, that the stillicidium of the urine is to be accounted for from the ulceration of the annex'd urethra and bladder. For neither of them was ulcerated in this case. But, what is an extraordinary instance of cause and effect, a scirrhus hardness, of both of them, brought on an incontinency of urine, and a retention at the same time.

For the hard parietes of the urethra could not be so constring'd, as properly to shut up the orifice of the bladder. And the hard parietes of the bladder, or, at least, the chief part of them, could not be so contracted, as the extrusion of the urine requires: nor could the remaining part of them, which was not hard, sufficiently help forward this discharge, in consequence of its having coalesc'd with the anterior paries of the belly, almost universally: and the discharge was somewhat impeded by those two thick bodies, which were prominent at the sides of the orifice. On all of which accounts it is not to be wonder'd at, if so much urine was retain'd, as not only to fill the enlarg'd bladder, but even to dilate the ureters, and the pelvis of both kidneys, with their tubuli.

35. And having made nearly these remarks upon the urinary parts, to those who were present, I then immediately added some of those things, in regard to the genitals, which I shall here subjoin: that the uterus, together with its appendages, was extremely subject to scirrhi; a disease that is extremely difficult of cure, unless you soon find it out; and incurable if it has degenerated into a cancer. That I had heard one of my preceptors, I mean Albertini,

(*g*) Advers. anat. dec. 2. c. 9.

(*r*) Vid. Sepulchr. sect. hac 21. obs. 23. in additam.

say that he had, with great success, discuss'd a tumour of the uterus, which seem'd to him, when he examin'd it with his hand, to be scirrhus, by the use of ground-pine alone, and without any excretion being the consequence thereof: that another of my preceptors, I mean Valsalva, was us'd to assert in his medical opinions, that either for cancerous tumours of the uterus, or of the breasts, he had found the practice of bleeding, four times a year, to be the most advantageous remedy to prevent their increase; that is to say, bleeding twice in the spring, and twice in the autumn. But he said it was manifest that, in the latter cases, the strength was to be attended to; and agreeable to reason, that, in the former, the causes of the scirrhus should be consider'd.

For although the ground-pine, by its attenuating and absterfivè quality, takes away obstructions of the viscera, and hardnesses of the breast, according to the observations of the ancients; yet that I should not be willing to give it to those women who had been subject to uterine fluxes, as the woman was, whose history I have given; but would very readily give it to those, who, by having matter translated to the uterus, from the joints which were affected with arthritic pains, had lately fallen into a slight obstruction thereof; for it will excite the menstrual discharges, but is opposite to the cause of the gout, as you know.

Moreover, that the extensions, the species, the seats, and the origins, of uterine schirri differ much from one another. That this had been extended widely to the vagina also, and the parts annex'd to it; and not only laterally, but even on the anterior part; that is in the urethra, and bladder, on the surface by which it was turn'd towards the uterus. That the whole of it had consisted of a uniform and hard substance; and this of such a kind that, even when turn'd into an ulcerated cancer, the odour of which is generally extremely offensive, it had no disagreeable smell. That the situation of this, in regard to the uterus itself, had been the whole cervix; whereas, there are those, to which part of the cervix, or part of the fundus, or the whole fundus, afford a situation. Finally, that the origins of some are internal, and of others external. And having said these things in a brief manner, and hinted slightly at those which relate to the suet-like matter, found in one of the testes, I made an end of speaking.

36. But to you I will now explain, somewhat more at large, the last of those remarks, which I then made with so much brevity. I believe that I have seen the origins, or first principles of uterine scirrhi, more than once, both internally, and externally. As to the internal, however, I shall have a more convenient opportunity of speaking thereof hereafter (s); I shall here only mention the external.

On the external surface of the uterus, then, I have seen tubercles prominent, being fix'd in the nearest part of its substance; at one time of a red colour degenerating into livid, and at another time of a white colour, and a scirrhus hardness; as by reading over again my letters (t), or by examining some of them that I am to send you hereafter (u), you will clearly per-

(s) Epist. 47. n. 26. & seq.

(t) Ep. 38. n. 28. & ep. 37. n. 29.

(u) Ep. 56. n. 20.

ceive. And I suppose these tubercles to be enlarg'd, and grow out into scirrhus tumours. For as to the pustule which I have describ'd to you on another occasion (*x*), as being seen by me in the same situation, and the little bodies which Valsalva saw scatter'd about (*y*), and the tubercle seen by Santorini (*z*); I do not doubt but they belong quite to another class; inasmuch as the last-mention'd was of the species of encysted tumours, and the others either had pus in them already, or because, as they had a similar appearance in other places, they would have had a pus afterwards, or a pultaceous matter.

For the uterus has, sometimes, ulcers also externally, and not these only, but excrescences likewise; and in regard to these, you will read the descriptions of two very large ones in the Sepulchretum (*a*); one of which consisted of a coat that was "like lard, or suet;" and the other was even "fill'd with fat." And these two I particularly point out; because, in the same place (*b*), a passage of Severinus is quoted, wherein he confesses, "that on the external habit of the uterus, he had very often happen'd to meet with melicerides, and atheromata:" but at the same time does not call to mind, if I understand him rightly, whether he had ever happen'd to see "any" of the steatomatous kind in that part.

But, at least, in the same section of the Sepulchretum, to omit the example (*c*) of the greatly-enlarg'd uterus, which "universally resembled a kind of cartilaginous fat;" for this certainly belongs more to scirrhi than to steatomata; at least, I say, "an abscess in the collum uteri, resembling the nature of a steatoma," is mention'd from Ballonius (*d*); and Rhodius (*e*) has expressly mention'd "a steatoma adhering to the fundus uteri;" and Goetzius (*f*) describes another: and I have describ'd to you, in the preceding letter (*g*), the very substance of the fundus uteri, as well as the testes and tubes, converted into a suet-like matter; and it is not at all surprizing, that what happens internally, should also take place externally; provided the sebaceous particles, wherewith the blood abounds, be carried to the external parts of the parietes uteri, as well as to the internal: although we have less frequent examples of the uterus being affected with a steatoma, than of the testes.

Omitting, therefore, such as I do not suppose to relate to scirrhi, I consider the other diseases, which I have taken notice of above, as their primordia, and others of the same kind, likewise, as, for instance, that which is describ'd by Paawius (*h*), as "a white excrescence of the bigness of a wart; which, when cut into, contain'd nothing within, but was solid in every part:" and still more those describ'd by Ruysch (*i*), under the appearance of "small round tumours, in a very scirrhus state, or rather scirrhi, not only growing to the uterus, by the intervention of a peduncle, but even without it;" which uterus was every-where beset with the same kind of tumours, and others of different magnitudes.

These two examples you will add to as many others; for Crellius has not

(*x*) Ep. 35. n. 16.

(*y*) Ep. 22. n. 18.

(*z*) Ep. 19. n. 51.

(*a*) Sect. hac 21. obs. 54. §. 1. & 18.

(*b*) Ibid. schol. ad obs. 37.

(*c*) Obs. cit. 54. §. 15.

(*d*) Ibid. §. 11.

(*e*) Cent. 3. obs. 46.

(*f*) Act. n. c. tom. 2. obs. 207.

(*g*) N. 34.

(*h*) Sepulchr. sect. cit. obs. 4. §. 32.

(*i*) Thef. 6. n. 30.

produc'd any more, of this kind, in that *Programma* (*k*); wherein he, also, has undertaken to describe a hard and solid "tumour," of the bigness of a mulberry, "which adher'd, externally, to the fundus uteri." And I said, of this kind, for he has also made remarks on another kind; as you may see in his works: and indeed bony tumours, or tumours in a manner bony, are spoken of in the *Commercium Litterarium* (*l*).

Nor would observations be wanting, if the question were of them in this place, of the uterus; which either seem'd to be affected with a scirrhus tumour, on account of many stones wherewith its substance was stuff'd up (*m*); or was really scirrhus, in one half of it (*n*); or in the whole (*o*); so as to be equal to the weight of four and forty pounds: and histories of tumours would be at hand, the situations of which might easily impose upon the physician who examin'd them with his hand, so as to make him take them for scirrhi of the uterus; whereas they in fact had not the least reference to this; but either belong'd to the fundus of the bladder (*p*), or to some other neighbouring part (*q*).

But not to digress from the discourse which I had begun, upon external scirrhus tubercles, and even to finish it; if you should enquire, how it happens that scirrhus tubercles may be, sometimes, found hanging, by a very narrow peduncle, from the uterus, as I have said was seen by Ruyfch, or from the other viscera; although this may be conceiv'd of in more ways than one; yet it will here be sufficient for me to recal to your mind that method by which I have explain'd hydatids (that hang in the same manner, and the transformation of these into hard tubercles, after discharging their fluid) in the preceding letter (*r*); for that the uterus has its hydatids also, is sufficiently demonstrated in the same place (*s*).

For I must, here, pass over, from tumours of the uterus, to tumours of the ovaria: of which, however, I shall say so much the less at present, as I was under necessity of saying so much in the preceding letter: and to what was there said, you may add what follows.

37. A woman, who seem'd to be about forty years of age, being oppress'd with a violent disorder within the thorax, was brought into the hospital of St. Mary de Morte at Bologna, about the end of April, in the year 1706; but so late in the disease, that, dying soon after, she could not even tell any one, under what disagreeable symptoms she had labour'd, through the course of her disease.

Being about, therefore, to open her body, in order to examine, with accuracy, into the structure of some of the viscera of the belly, and having observ'd two things; that in a pretty laudable habit there was no appearance of the breasts, besides the areolæ, and the nipples; and that the abdomen was mark'd with no furrows, or rugæ, so that it appear'd she had never born any children; I observ'd, at the same time, a certain tumour, not ac-

(*k*) Vitembergæ. a. 1739.

(*l*) A. 1735. hebdom. 51. n. 2. in fin. & a.

1742. hebdom. 45. in fin.

(*m*) Eph. n. c. cent. 1. & 2. obf. 77.

(*n*) Cent. 9. obf. 31.

(*o*) Hist. de l'Acad. R. des sc. a. 1748.

(*p*) Cit. eph. cent. 1 & 2. obf. 186.

(*q*) Eph. earund. Dec. 3. a. 7. & 8. obf. 123.

(*r*) N. 38. in fin. & n. 35.

(*s*) N. 42.

cuminated, but flat; which, in some measure, rais'd up the hypogastrium, and that part of the umbilical region, which was nearest thereto.

The belly, therefore, being open'd, I saw that the cause of the abdomen being tumid in that part, was a certain body, of the bigness of a very large fist; by which the intestines, that lay thereon, were driven upwards and outwards. This body was in the middle of the pelvis; of a roundish figure, and of a tuberos surface; but in some places smooth and even; so as to make it appear, at first, that it could be nothing else but the uterus tumefied. Yet it was, in fact, the left testis, that had grown out into this bulk. The dense coat whereof was, here and there, unequal, with certain small abscesses; some of which being spontaneously open'd, discharg'd a white pus; such as many of them contain'd.

From the body of the testis itself, a thin bloody ichor was express'd, mix'd, with pus; yet not in great quantity. But when I had quite laid it open; and had agitated it for some time in water; I plainly perceiv'd, besides some fibres, and vessels, and one or two cells, of the bigness of a small grape, which comprehended, within a black coat, something very similar to coagulated blood; I plainly perceiv'd, I say, that the remaining, and much greater part, that is, almost the whole solid part of this body, was nothing else but a congeries of reddish vesicles, crouded closely together, so as to be of an incredible number, by reason of their smallness; and all of them distended with a dirty-colour'd serum.

Yet the foetidness of the smell was not very considerable: nor was the neighbouring tube injur'd, although externally, as well as the other, it had hydatids: nor had the uterus itself, to the side of which the describ'd body was annex'd, contracted any disorder therefrom, except in its external membrane. For I cut through it; and observ'd only this one thing, which did not at all relate to the tumour; that, at the sides of this cavity, the anterior paries was connected to the posterior, by small membranes passing betwixt. The other testis was small, unequal in its surface, and had only one vesicle contiguous to it, which was pretty large; and contain'd a small quantity of fluid under its thick white coat: in the other parts it was white and hard: yet from one very small part of it, was discharg'd a little quantity of white pus.

38. Disorders of the testes happen so frequently to women, compar'd with the females of other animals; and especially tumours, either of a dropical nature, or of other kinds; that it is very natural to conjecture most of these things to happen, not without the passions of the mind being, in some measure, the cause of them. For what effect these passions may have, in retarding, or disturbing, the course of the humours, is by no means unknown. Yet to this we may add the monthly afflux of blood into the uterus, and the parts that lie about it; which we know frequently deviates from the original intention of nature, in many different ways. Add to these causes, also, the bulk and weight of the uterus, when impregnated; by which, when the woman stands, or sits down, the testes are press'd closely against the bones of the pelvis; and still more when it contracts so very strongly in a difficult birth; or unseasonably, in one which would certainly be easy, and natural, if not accelerated by the improper haste of midwives; who are, for the most part, unskilful. For these, therefore, and other reasons, it is not surprizing if the
testes.

testes of women are frequently diseas'd, become tumid, and increas'd to such a degree, that they very often resemble even an ascites; as in that observation, which was made in the same hospital at Bologna, by a very learned and diligent man; I mean Heraclito Manfredi; who was with me, when I made the former, and many others. I will communicate it to you, in the same manner that he communicated it to me, when I resided at Venice.

39. A woman, who had been suppos'd to have an ascites, died. The belly was not found to be fill'd with extravasated water; but with a tumour of the left testicle. This tumour weigh'd four and twenty pounds; being fill'd, in great measure, with a viscid and black humour; which you might very well compare with the dirty water, that flows through the channels, in the streets of a city. The other contents of the tumour were shut up in vesicles of unequal magnitudes, which communicated one with another; some of them being fill'd with a yellow, some with a viscid matter, and others with a lymph, which, when put on the fire, did not coagulate. Although it was connected to no part, except the left side of the uterus, yet it was quite immoveable, to which-ever side the body was turn'd; because, as it fix'd down a kind of lower appendage of itself, which consisted of many hydatids, betwixt the uterus and the intestine, it so exactly fill'd the inferior part of the pelvis, that while it was drawn out from thence by force, a sound was heard, similar to that which is made by pulling away a cupping-glass from the skin.

40. In guessing at the nature of other hidden diseases, and particularly of this, we must join together many marks, even for this reason, that some one of them may happen to be absent sometimes, as here. For among the signs of this disease, some mobility of the tumour is plac'd by Schorkopffius, in the dissertation which he publish'd at Basil, in the year 1685, *de Hydropse Ovarii Muliebris* (*t*); a dissertation that merits more than ordinary praise; especially when we consider the time wherein it was written; even on account of the observations of this disease, which he had receiv'd from that very great physician and anatomist, Wepfer (*u*); which I am not so much surpriz'd should be unknown to Nuck (*x*), as that they were omitted in those additamenta to the Sepulchretum; wherein (*y*) the words of Harderus, in which he expressly commends this dissertation, and those observations, are copied.

However, in the first times of the disease, perhaps, (which, as I said in the preceding letter (*z*), ought, for this reason, to be attended to) there might, probably, have been a mobility of the tumour, in the woman in question: as there may, at the same early times, also, be "a semicircular figure of the tumour," in the dropsy of the tube, according to the conjecture of Brechtfeld (*a*), which Schorkopffius (*b*) has follow'd; in order to teach us by what mark we may distinguish the dropsy of the ovary, and the dropsy of the tube, from each other: yet when the disease is advanc'd, I do not doubt but the tumour of a dropsy in the tube, no less than that of an aneurism in the artery, comes near to the oval, or spherical figure; which is confirm'd from

(*t*) Thef. 21.

(*u*) Thef. 16. 17. 23.

(*x*) Adenogr. c. 8.

(*y*) Schol. ad obs. 47.

(*z*) N. 60.

(*a*) Bartholin. act. Hafn. vol. 1. p. 1. obs. 103.

(*b*) Thef. 22.

the delineation given by Munnickius, of a dropfical tube, to illustrate that observation, which is spoken of by me in the same letter (*c*).

But while I was attending to a number of histories of tumours, of whatever kind, in the testes of women, it happen'd to come into my mind, that this might, perhaps, be added to other marks thereof: I mean that it begins in the left part of the hypogastrium. For I observ'd that the tumour was in the left testis, and not in the right, which was seen by Manfredi (*d*); and that which was seen by me also (*e*); and not only these, but those likewise which were seen by Kerckringius (*f*), Wepfer (*g*), Harderus (*h*), Nuck (*i*), Drelincourt (*k*), Reifelius (*l*), Gahrlepius (*m*), the younger du Verney (*n*), and this last author in two cases; Rud. Jac. Camerarius (*o*), Maggi and Dodi (*p*), Riedlinus (*q*), Schacherus (*r*), Alexander Camerarius (*s*), Gullmanus (*t*), Guttermannus (*u*), Bassius (*x*), Vacherius (*y*), Benevolus (*z*), Targioni (*a*). And, indeed, where there was a tumour of both the testes, the largest was found, by Hunerwolffius (*b*), in the left: nor do I forget that I have describ'd to you hydatids, as being seen by me, within the left only (*c*); or much larger in this (*d*), than the other.

As I was attending to this very great consent, in such a number of observations; and was already so far settled in the opinion, as to be much dispos'd to account for the cause of the difference, from the less expeditious return of the blood, from the left testis, to the vena cava; as from thence it must be brought through a much longer passage, than from the right; I recollected that I had, however, read not a few examples of tumours, which belong'd to the right testis. For Vesalius (*e*) had seen the right grown out into nine or ten large hydatids. And in the same also since that, when it was distended with serum to the quantity of nine pints; an example "of the dropfy of the testes" is propos'd by Casper Bauhin (*f*): who (*g*), with Hildanus (*h*), at another time, likewise, saw the right testis of the magnitude of a goose's egg, full of oblong hairs, and a mucous matter.

These hairs were also found by Blasius (*i*), together with other things, in the testis of the same side; which was increas'd into a very great bulk. And as there were others besides, whom I shall mention below (*k*), that found hairs in tumours of the testes; there were some, as I shall then say, who saw them in the left; and yet as many who saw them in the right.

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|---|---|
| (<i>c</i>) N. 59. | (<i>t</i>) Eorund. t. 2. obf. 80. |
| (<i>d</i>) N. 39. | (<i>u</i>) Eorund. t. 3. obf. 105. |
| (<i>e</i>) N. 37. | (<i>x</i>) Dec. 4. obf. anat. 8. |
| (<i>f</i>) Spicileg. anat. obf. 10. | (<i>y</i>) Hist. de l'acad. r. des sc. a. 1739. obf. anat. 3. |
| (<i>g</i>) Apud Scorpoff. th. 17. | (<i>z</i>) Osservaz. 9. |
| (<i>h</i>) Ibid. thes. 15. | (<i>a</i>) Prima Raccolta di osservaz med. |
| (<i>i</i>) C. cit. | (<i>b</i>) Eph. n. c. dec. 2. a. 9. obf. 99. |
| (<i>k</i>) Ibid. | (<i>c</i>) Epist. 15. n. 8. |
| (<i>l</i>) Eph. n. c. dec. 2. a. 10. obf. 27. | (<i>d</i>) Ep. 21. n. 47. |
| (<i>m</i>) Eorund. dec. 3. a. 2. obf. 61. | (<i>e</i>) De corp. hum. fabr. l. 5. c. 9. |
| (<i>n</i>) Hist. de l'acad. r. des sc. a. 1703. | (<i>f</i>) Theatr. anat. l. 1. c. 35. |
| (<i>o</i>) Biga. obf. med. c. 1. | (<i>g</i>) Ibid. |
| (<i>p</i>) Apud Vallisner. istor. della generaz. p. 3. c. 5. & tab. 12. | (<i>h</i>) Cent. 5. obf. 48. |
| (<i>q</i>) Eph. n. c. cent. 7. obf. 56. | (<i>i</i>) Part 1. obf. med. 9. |
| (<i>r</i>) Dissert. de virg. ascitica. | (<i>k</i>) N. 41. |
| (<i>s</i>) Act. n. c. tom. 1. obf. 160. vers. fin. | |

A tumour of the same testis (not to detain you with a long detail) you will find to have been seen by Christopher Harderus (*l*); by Theodorus Zwinger (*m*); by Lebenwaldius (*n*); by Gandolphius (*o*); by Klaunigius (*p*); by Jo. Dav. Mauchartus (*q*); by Miegius (*r*); by Alexander Camerarius (*s*); by Trew (*t*); and even by our Mediavia; as I have written to you in a former letter (*u*).

Nor, indeed, do I find any difference betwixt the tumours of the right, and the left testis, in one and the same woman; whether describ'd by Heintzius formerly (*x*); or, afterwards, by Nabothus (*y*), and by Laubius (*z*); nor have I seen any in those which I have given the histories of, in the preceding letter (*a*): or, if I find any difference, it is in the greater magnitude of the right; as in the observations of Bauhin (*b*), of Gandolphius (*c*), and of Goetzius (*d*).

In the last place: If the question be of hydatids, growing to the substance of the testis, Kerckringius (*e*) has observ'd, that those which he found, in an infant, "of the bigness of a pigeon's egg," were not at the left, but upon the right testis. There were, without doubt, many more observations on both sides: for I have only taken notice of those which I at present call'd to mind; not so much as you might perceive it to be the effect of meer chance, that so many observations occur'd to me at first, and all of them taken from the left side, as that you might have a great number in readiness, if, by comparing them one with another, you might be able to draw useful hints from some, in order to conjecture at a hidden, and, at the same time, frequent disease.

41. Nor is what I said of hairs being found, within the testes of women, by Bauhin, and Blasius, very extraordinary. For Bauhin (*f*) has propos'd that observation in such a manner, as to hint that it was not the only one, nor the first: and, afterwards, both Blasius, as I have said, and others, among whom is Wepfer (*g*), and Andreas Veronicus (*h*), found the same appearance; but these two on the left side; yet, on the right, were they found by Stalpart (*i*), and the celebrated Haller (*k*): and not to add more, some learned men of Bologna observ'd them once and again in the same city, and in my memory; and Menghinus, and Bonzius (*l*), lately, in the left testis; and three and fifty years ago, he whom I spoke of above (*m*), Manfredi, in the right.

(*l*) Eph. n. c. dec. 1. a. 3. obs. 180.

(*m*) Earund. dec. 2. a. 9. obs. 136.

(*n*) Earund. dec. 3. a. 1. obs. 92.

(*o*) Hist. de l'Acad. R. des. sc. a. 1707. obs. anat. 4.

(*p*) Eph. n. c. cent. 7. obs. 64.

(*q*) Earund. cent. 8. obs. 14.

(*r*) Act. n. c. tom. 1. obs. 85.

(*s*) Ibid. obs. 160.

(*t*) Comm. litter. a. 1734. hebdom. 44.

(*u*) Epist. 29. n. 14.

(*x*) Apud Schenck. obs. med. 1. 3. ubi de hydrope obs. 6.

(*y*) Disput. de sterilit. mulier. n. 11.

(*z*) Eph. n. c. cent. 5. obs. 21.

(*a*) N. 34.

(*b*) Cit. c. 35. primo loco.

(*c*) Cit. hist. primo loco.

(*d*) Act. n. c. tom. 1. obs. 207.

(*e*) Obs. cit. 10.

(*f*) C. cit. 35.

(*g*) Vid. thes. 17. Schorkopffii cit. n. 40.

(*h*) Apud Targioni cit. ibid.

(*i*) Cent. 2. p. 1. obs. 37.

(*k*) Opusc. pathol. obs. 42.

(*l*) Comment. de Bonon. sc. acad. t. 2. p. 1. inter medica.

(*m*) N. 38.

For he wrote to me that a globe of the bigness of a very large egg, comprehended in a white, and almost cartilaginous, coat, yet in some places pretty thin, and of a blackish colour, was grown to the substance of the right testis: that within this globe had lain hid a quantity of hairs, in a conglomerated state, quite disjoin'd from that coat, and daub'd over with a kind of suet, as it were: that within the conglomerated hairs was a certain nucleus, from which some vessels went into the continu'd substance of the testis. Which vessels and nucleus I do not remember to have been observ'd by others; nor yet the two circumstances which Bauhin had remark'd, that is to say, white hairs fix'd into the surrounding coat, but none at all on the pubes of that woman; although she was by no means a girl, and had even brought forth a child.

But while I was revising this letter, I lit on a programma, entitled, *de Ovarii Tumore Pilofo*, publish'd at Leipzig, in the year 1735, by Polyc. Gottl. Schacherus; who not only mentions other observers of hairs, and of a fat matter, in the testes of women, and especially on the right side; but describes the same things, also, as being found by him in the left testis, which was very considerably enlarg'd: and, in particular, says much on the subject of these hairs; and confirms, not only by words, but even by figures, that they had come forth "from the internal surface of the incrassated coat, which, for that reason, he does not scruple to compare with the external hairy skin of the head. And indeed I have remark'd that hairs had been also seen by the celebrated Targioni (*n*), inherent, by one of their heads, in the thick and tenacious coat, just as they generally are in the skin. But from what cause hairs are form'd within the testes, if they are really hairs, it is difficult to say: and yet not more than within other parts. For even Cornelius Celsus (*o*), has said, that in tumours of the thyroid gland, "hairs mix'd with small bones," are sometimes included: and others, quoted by the celebrated Heister (*p*), have seen them in different places; as I myself also have (*q*) within the transverse process of the dura mater.

But this letter is already very long; so that it rather becomes me, now, to see how I may conclude it with some observation that shall answer to that last of Valsalva's (*r*). This will be an observation, if not of the stomach being prolaps'd, at least of the spleen; and will be taken from the very friendly letter of the same Manfredi, whereby, in the year 1718, he communicated this, as he did, in like manner, two others, which were by no means common observations.

42. There was a man, who had a swelling of his belly, in the region of each groin. But the left tumour, which was well-known to be a hernia, as it had brought on death by causing an ileos, gave us occasion to know what the right was.

For the belly being open'd, the spleen was found at the right groin, from whence it could not be remov'd, although the body was much shaken by taking it out of the grave. This spleen was about the weight of three pounds, of the thickness of five inches, twelve in breadth, and as many in length. It was

(*n*) Cit. supra ad n. 40.

(*o*) De med. l. 7. c. 13.

(*p*) Epist. de pilis, &c. ad Paverum.

(*q*) Epist. anat. 20. n. 58.

(*r*) Supra n. 14.

connected to the stomach, by a kind of rope which lay hid under a part of the intestines, being two inches in thickness, made up of sanguiferous vessels, and contain'd in a thickish coat like a capsula; so that in colour, and a certain contorsion of vessels, it was like the funis umbilicalis; although, externally, it had certain appendages, the remains perhaps of the lacerated membranes, which, at first sight, resembled those adipose appendiculae, wherewith the large intestines are furnish'd. The branches of the veins that go to the spleen were extremely dilated: and that which is call'd the vas breve easily admitted the fore-finger.

43. Although Blasius (*s*), when he publish'd the same observation of a prolaps'd spleen, which Ruych (*t*) publish'd afterwards, said something more than the other, of what had been observ'd, both in the living body, and after death; and among these things, of "the splenic vessels being increas'd to a surprizing degree, both in length, and capacity;" yet I do not remember to have read any author, who has describ'd the funis of the splenic vessels, in cases of that kind, with more accuracy than Manfredi.

But, as to what relates to the causes of this disease, I acknowledge, indeed, that the weight of the spleen being increas'd, must have had great effect in relaxing, or breaking through, the membranous bands, which connect it to the septum transversum; and, indeed, most of the observers have either mention'd, or hinted at, an increas'd weight, together with the prolapsus. However, when I call to mind those enlarg'd spleens, which had by no means fallen down; such as I have more than once describ'd to you (*u*), or such as you will read of in the Sepulchretum (*x*); I readily perceive that some other causes ought to be added to that of weight, as, for instance, the greater laxity, or weakness, of those ligaments, a fall from a high place, or other things of a similar kind; among which consider whether you choose to place that which Riolanus (*y*) suppos'd of the kidney. His words are these, "the cause of a laxation of the kidney may be a violent, and long-contin'd cough, which, perpetually agitating the diaphragm, may remove one or other of them from their situation;" that is, one or other of the kidneys, which lie upon the diaphragm.

44. But by what signs this disorder may be known, and distinguish'd from others, is to be enquir'd from the histories thereof: although not all those who found it in the dead body, could inform us how the patients had been particularly affected, when living. For certainly these symptoms are not peculiar to a prolapsus of the spleen, that we have in Ballonius (*z*), in an example which is of ancient date, when compar'd with the others. Nor from the observation of Cabrolus (*a*), which, perhaps, was not made long after the former, can we gather any thing else, except that the spleen could easily be perceiv'd, in the living, as well as in the dead body, "to swim through the whole cavity of the belly." Which is a sign that, I believe, may not

(*s*) P. 1. obs. med. 14.

(*t*) Obs. anat. chir. 62.

(*u*) Vid. præsertim epist. 36. n. 11. & 17.

(*x*) L. 3. sect. 16. obs. 9. & seq. plurib. & sect. 21. obs. 34. §. 1. 2. 3.

(*y*) Anthropogr. l. 2. c. 26.

(*z*) Epidem. l. 2. vere a. 1578.

(*a*) 6. in obs. var.

be altogether without its advantage, but ought to be attended to, as I have said of others more than once, in the earliest times of the disease.

For in process of time it may easily be wanting, in consequence of the spleen being become immoveable, as you have seen in the observation I have given you from the letter of Manfredi; and as you will see in Ballonius: for the spleen lying upon the bladder, “adher’d thereto very closely.” This is confirm’d by Riolanus, where he says, in his *Encheiridion* (*b*); that this disorder had been “four times seen” by him: and, certainly, in his *Anthropographia* (*c*), he does produce two examples, in both of which the spleen had connected itself to the uterus, and the neighbouring parts, so firmly, that in one of them, it could no more be replac’d in its situation as before, while the woman was living; and in the other it long impos’d upon the physicians by the appearance of a mola.

The same author gives us these marks (*d*), whereby to distinguish it from a prolaps’d kidney, “an oblong tumour, and an emptiness of the left hypo-“chondrium;” the last of which we must enquire after in the patient, when fasting; and if we perceive it (which is easy to do, in a patient in whom the spleen has been perceiv’d to be tumid before its prolapsus) we shall have a much better mark to distinguish this prolaps’d state of the spleen, from any other hard tumour of the epigastrium, than its figure; which, in diseas’d parts, and particularly in this, as even Riolanus (*e*) himself teaches, we are not ignorant may frequently and considerably vary.

But from the example of Blasius (*f*) we may gather two things; one, that if we should chance to meet with what happen’d to him, as I suppose, for this reason; because the spleen had fallen downwards gradually, the ligaments being by degrees relax’d, and not speedily ruptur’d; that is if we should happen, first, to perceive a considerable tumour occupying the left hypochondrium, with some part of the epigastrium; and, after some space of time, find that it occupies the hypogastrium, more than those parts; we may then be confirm’d in our conjecture: for otherwise, to attend to the place only, in which we shall at length perceive it, although it may be sometimes of use in our determination, that we feel it on the left side; yet in this method of judging we may sometimes be deceiv’d, as the observation of Manfredi (*g*), who found it at the right groin, demonstrates.

The second conclusion which we may gather is, that, if the other signs show the tumour to arise from the prolaps’d spleen, we are not, because the tumour sometimes retains its mobility, “beyond the space of six months,” which Riolanus (*h*) had fix’d, so as to change its situation, on a change of situation in the body; we are not, I say, for this reason to imagine, that the tumour cannot be from a prolapsus of the spleen. For although it is wont, at other times, to adhere very easily, as I have said; yet in the case of Blasius it was pendulous even then, though the tumour had existed “more than three “years and a half;” and could even be variously mov’d, according to the various agitation of the body. And from the same case we learn, as it is re-

(*b*) L. 2. c. 26.

(*c*) L. 2. c. 23.

(*d*) *Encheir. c. cit.*

(*e*) *Ibid.*

(*f*) *Obs. supra ad n. 43. cit.*

(*g*) *Supra, eod.*

(*h*) *Encheir. c. cit.*

lated by Ruysch (*i*), that this disease happens, sometimes, after a difficult birth, and not without the most violent pain: the former of which confirms what we have added in regard to the causes of the disease (*k*); and by the latter we are admonish'd that we must not suppose pain to be wanting in all these diseases, and at every time of the disease, because the other histories do not make mention of it.

The history of Anthony de Pozzis (*l*) teaches us, that, notwithstanding an enlarg'd spleen, having chang'd its situation by reason of its weight, had occupied the hypogastrium, for four-and-twenty years, the woman had liv'd nevertheless, had been three times pregnant in that space, and had brought forth children that were healthy, and likely to live; so that we have less occasion to wonder that the other woman, spoken of by Ballonius (*m*), did once retain her foetus quite till the proper time of delivery; though she, at length, died in the birth. The observation of Drelincurt, given us by Schorkopffius (*n*), confirms nothing at all, but that physicians may easily be deceiv'd in this disease, by taking it for a utero-gestation.

Finally, the example of Bonetus (*o*) might go pretty far in proving what I just now said of excruciating pains in the belly, if there had not been another disorder besides, in the abdomen of that virgin. Nor do I remember, at present, to have heard, or read, more than these ten observations of the spleen being prolaps'd; so that Ruysch (*p*) might, with reason and justice, reckon "a prolapsus of the spleen into the pelvis," among the cases which he had remark'd as the most rare. Six of these observations relate to women, two to men: but the remaining ones might relate to either one or the other; as Riolanus (*q*) has only hinted at, and not related, them, by saying that unskilful and incautious physicians are deceiv'd in this manner, "by the appearance of a mole, or a scirrhus uterus, in women; and in men by the appearance of a glandular tumour, like a steatoma, lying hid in the mesentery."

It has never yet happen'd to me, to meet with this appearance in dissection, though I have been very desirous, on several accounts, to enquire with accuracy into many circumstances; but particularly to enquire what then happens to the annex'd pancreas, stomach, and the entire trunks of the splenic vessels. And there are indeed, in the observations which have been quoted, especially in that of Ballonius, and Cabrolus, some things which relate to the stomach. But as they might be from some other cause, and do not properly correspond, in this part, with the histories of Pozzi, and Bonetus, I have purposely pass'd them over.

45. I have, likewise, purposely said nothing of what was found by Hildanus (*r*), in the body of a woman; as I read that the spleen was very much enlarg'd, and extended to the hypogastrium indeed, but not prolaps'd thither; as it has seem'd to men in other respects very learn'd, in the mention (*s*) made by Hildanus of the same example, which they have suppos'd to be

(i) Obs. 62. cit. ad n. 43.

(k) Eod. n.

(l) Eph. n. c. Dec. 1. a. 4. obs. 30.

(m) Loc. cit.

(n) Dissert. supra n. 40. cit. thes. 22.

(o) Sepulchr. 1. 3. sect. 14. obs. 37.

(p) Resp. ad Bidl. vindic.

(q) Encheir. c. cit.

(r) Cent. 2. obs. 45.

(s) Epist. 55.

another observation. So I have consider'd, as a reference to, or commemoration of, an observation formerly publish'd (*t*), what Ruysch has said in his *Adversaria* (*u*): for it is not surprizing if he, being a very old man, should have written some things in this reference, which do not altogether agree with what he had said thirty years before; since even those things that he had then written, that is twenty years after he had observ'd them, do not sufficiently agree with what Blasius has recorded (*x*), at the distance of no more than seven years, from the time of making that observation; Blasius, I say, who was both consulted by the woman when living, and present at the dissection, which he says was perform'd by Ruysch on the twenty-fourth day of January in the year 1670.

Ruysch gives us the same year, and sufficiently determines the time of the year also, when he says that this very history of his is related in the third decade of Justus Schraderus, observation the fourth; who says, in this part of his work, that Ruysch had told him, on the thirty-first of March, in the year 1670, that he had "lately" perform'd the dissection. But if an observation of this kind were in the number of those, which might easily happen twice, to one anatomist, within two months, how came it to be rank'd among the most rare observations by Ruysch (*y*)? Yet Riolanus (*z*) saw it four times; and "twice," as I read while I am revising this letter, the illustrious Van Swieten (*a*) saw, in dead bodies, "the spleen in a scirrhus and enlarg'd state, and "fallen down quite to the pelvis," who I could wish had been at leisure to add the other circumstances that attended.

You will, however, take notice of these things: though it does not seem improbable to me, that any one person may have met with a prolaps'd spleen more than once; it does not, nevertheless, seem very probable that any one should have met with it twice, within the space of two months. Yet if you should think that this word "lately" is taken, by me, in too strict and confin'd a sense; although not by reason of this circumstance alone, that first observation of Ruysch has seem'd to me, by no means to agree very well with the descriptions of others, that were publish'd before; I am not averse to your considering the second as another, and numbering it with the rest, which are taken notice of above (*b*).

46. Finally, what Riolanus (*c*) thought of the cure, in the first times of the disease, and what he did with this view; and what he propos'd, or what he forbade, in case of the spleen being fix'd to the parts of the hypogastrium; you will learn from himself. For I am not willing to make still longer, a letter which is already too long; the prolixity of which, though not to be compar'd with that of the former letter, you will bear with the greater patience; when you observe, that I have, as I hate repetitions, almost finish'd therein, not only whatever relates to the section *de Ventris Tumore*, but also whatever belongs to the other *de Hypogastrii Dolore*. Farewel.

(*t*) Cit. supra ad n. 43.

(*u*) Dec. 2. n. 9.

(*x*) Cit. supra ad n. 43.

(*y*) Vid. supra n. 43.

(*z*) Supra n. 44.

(*a*) Comment. in Boerh. aph. §. 958.

(*b*) N. 44.

(*c*) Encheir. & Antrop. capitib. ad n. 44. cit. supra.

LETTER the FORTIETH

Treats of Pain in the Loins.

WE are now come to disorders, the peculiar situation and cause of which are frequently very obscure; that is to say, to those which relate to the urine, and urinary passages. And this will appear even from the subject with which I begin; I mean "the pain of the loins." For this frequently relates to the kidneys being affected with sandy particles, or calculi: although that it does not less often, either relate to some other part, or even to the kidneys themselves, when affected from other causes, you not only very well know yourself, but will very clearly perceive also, from those observations which I shall immediately describe to you, both from the papers of Valsalva, and my own. For the first of both of them will relate to the kidneys, and calculi; and the latter to other disorders of the kidneys, or of other parts. I will begin according to custom, as it is proper I should, with those of Valsalva that belong to the first class.

2. A priest of fifty years of age, having been many years subject to arthritic pains, especially of the fingers, was, at length, seiz'd with a nephritic pain. There was not only a frequent vomiting of bilious matter, but once also of blood, which had often been discharg'd by the nostrils likewise. After that his urine, from being in small quantity, and watery, began to be discharg'd in a larger quantity, together with a mucilaginous and opaque matter: convulsive motions of the whole body suddenly came on; and these returning again, but in a more violent manner, carried him off.

The belly being open'd, all the intestines were found to be of a colour inclining to livid. But the stomach was sound, and no traces appear'd of the place from whence the blood had proceeded. In the kidneys lay several very small calculi, some black, others of a white colour; and besides these there were sinuous cavities full of urine, but particularly in the right: the urine, also, by its quantity, had dilated the pelvis, and the ureter, which was continu'd therefrom.

In the head, the internal substance of the brain was, in some measure, pregnant with serum; but the ventricles of the brain particularly abounded therewith.

Finally, at the joints of the fingers, when the cutis was taken off, a tartareous matter was immediately found, in the membrane involving the tendons; and this matter was of a white colour inclining to yellow.

3. We may not only make many deductions from this observation (a method which will be often follow'd in this letter and others) but we may, in

particular, confirm that which often occurs in the practice of medicine; I mean, that to pains of the joints, are often added pains of the kidneys; and at length to the latter, very violent disorders of the brain. That is to say, they who are subject to the gout, as they can use motion of the body less in proportion, so they proportionably less agitate those muscles, by whose motions the contiguous kidneys may also be agitated; so as to prevent the urine from stagnating therein, and depositing the sandy particles, wherewith it is loaded. Turn to Boerhaave (*a*), and his illustrious pupil Haller (*b*), who rightly interprets the ideas of his master, and illustrates them. See, also, the observation of Littre (*c*) on a boy, who having a phimosis that prevented his urine from being properly discharg'd, this fluid, for that reason, stagnated betwixt the glands and the prepuce, and produc'd an incredible number of small stones; none of which was any more produc'd, after the phimosis was remov'd.

But as, when a calculus is already form'd in the kidneys, an obstacle frequently happens, from thence, to the urine, and less superfluous serum is, for that reason, discharg'd from the constitution; so this serum may be redundant in the brain: or even the roughness of the calculus, by very vehemently irritating the kidneys, may sometimes excite convulsions in the whole body; and, therefore, in the brain, as well as in other parts. However, by which method you choose to explain the convulsive motions, in the priest in question, or even death itself, I leave entirely to your own discretion: although the discharge of a mucilaginous matter, from the urinary passages, which was succeeded by the convulsions and death, seems to give great countenance to the second supposition.

That is to say, this mucilaginous humour, with which the pelvis, and the tubuli belonging thereto, that receive the papillæ of the kidneys, are, like the bladder and ureters (inasmuch as they are made up of the same continu'd coat) smear'd over internally, in order to defend them against the acrimony of the urine; this humour then being increas'd, and become thicker, from the irritation of the calculus, diminishes the force of that irritation, as long as it adheres to the calculus, and interposes itself betwixt the rough surfaces thereof, and this internal irritable coat. But when this mucilaginous humour has left the coat without defence, in consequence of being forc'd down, by medicines improperly given to increase the urinary discharges; or from any other cause whatever; it must then, of course, follow, that the irritations are more violent. But you will, in my opinion, choose rather to make use of the first explication, in the history which I shall next subjoin.

4. A man about sixty years of age, of a very fat habit of body, who, while he was a young man, had been troubled with great difficulty in making water; so as to be oblig'd to stand on tip-toe, sometimes, to discharge it; had his urine wholly suppress'd, together with a very violent pain in the loins, but without any vomiting. He had, every day, a very considerable fever, the rigor and coldness lasting for two hours. When the catheter was intro-

(*a*) Prælect. ad §. 352. inslit. & ad §. 365.

(*c*) Hist. ad l'Acad. R. des sc. a. 1706. obs.

(*b*) Not. e ad primum. & d ad alter, cit. anat. 6.

Boerhaav. locum.

duc'd he discharg'd a bloody matter, and with it a calculus of the bigness of a small almond. This was succeeded by bloody urine. But afterwards, the urine grew clear, and became like that of healthy persons; yet was not without a foetid smell: and the pain in the loins always continu'd. The disease having apparently remitted, as I have said, the patient was seiz'd, on the night of the fifth day, with a kind of epileptic concussion, as it were, of the whole body, attended with a bloody foam at the mouth; and in this manner departed out of life.

The belly being laid open, the bladder appear'd to be full of urine, which was in a natural state, except that it had a very ill smell. The fleshy fibres of the bladder were become much thicken'd, so as to resemble the bundles of muscular fibres in the heart. About the cervix thereof, were found some grains of sand. However, there was no obstacle found in the bladder, whereby the discharge of the urine could be prevented. The ureters and the kidneys were perfectly sound.

In the thorax, the lungs were turgid, and ting'd of a black colour: but the left lobe adher'd closely to the diaphragm. The right ventricle of the heart contain'd a polypous concretion; the left was full of a fluid blood.

5. Whatever had been, formerly, the cause of that difficulty in making water, from whence it is probable, as will be demonstrated on a future occasion (*d*), that the thickness of the fibres of the bladder was brought on; the last disease, that relates to the urinary parts, seems to have been the effect of the calculus. For this might be so much the more easily generated, in one or other of the kidneys, as the weight of fat, in a very bulky man, render'd exercise of body less easy (*e*). To this method, by which Boerhaave (*f*) suppos'd a stone to have been form'd, in one of the kidneys of a very fat man likewise (for both of these viscera are not always equally dispos'd to this concretion) you may also add another; which, with the same author (*g*), you will attribute to a quantity of fat, pressing upon the kidney, and the ureter; and, for that reason, retarding the course of the urine, just as the want of exercise retards it.

Indeed, in those persons who eat very plentifully, and very often, and have their stomachs, and intestines, for that reason, generally distended with too great a quantity of ingesta; to the other causes, whereby they become subject to calculi of the kidneys, add this in conjunction with me, that the kidneys, and particularly the left, and both the ureters; inasmuch as they are situated betwixt the posterior paries of the belly, and those viscera; are more than properly compress'd. And this cause being added to those other causes, in the gentleman whom Scroecius (*h*) describes, it is so much the less to be wonder'd at, that in one ureter was found a calculus of a considerable size; and in the opposite ureter, a very large one, with so many smaller calculi. But the compression, either from a quantity of fat, or ingesta, is so much the more noxious in very bulky constitutions, because they generally lie on their backs: which situation of body lays both the kidneys, and the ureters, under a necessity of being more compress'd, by the incumbent weight of vis-

(*d*) Epist. 42. n. 33.

(*e*) Vid. supra n. 3.

(*f*) Ad §. 365. *ibid.* cit.

(*g*) Ad §. 387.

(*h*) Act. n. c. tom. 1. obs. 247.

cera; and the more frequent, and long-continued, this posture of body is, so much the more is the descent of the urine prevented.

Thus likewise, when you read a certain observation of the celebrated Fantonus (*i*), on a man subject to nephritic pains, especially in the left side, and whose left kidney, which was twice as thick as it naturally is, and contain'd two calculi, was cover'd over "with a certain concreted matter, similar to lard, in "one part as thick as ones little finger is broad, and, in another, thicker "than a man's thumb;" which, however, did not cover the other kidney; you will, without doubt, readily suppose the fat to have been injurious in that case. In our man therefore, to whom I now return, the calculus, which was already generated, might bring on both the pain of the loins, and the suppression of urine; either by shutting up the upper part of the ureter, or the beginning of the urethra.

For although it does not always happen, yet frequently it does at least, that when one kidney is affected, the other is also drawn into consent. And when the calculus was remov'd, by the force of the incumbent urine, and thrust down into the lower orifice of the bladder, the pain of the loins might continue, nevertheless, in the same manner that the pain of the kidneys is, sometimes, wont to be extended towards the bladder; that is to say, by means of the ureters, which are, on one hand, continued to the kidneys, and, on the other, to the bladder: and, when the bladder can admit no more urine, are themselves distended therewith. And though this urine should be drawn off, by the introduction of a catheter, yet how soon it would fill the bladder again, the inspection of this bladder, after the death of the patient, demonstrates.

But if you imagine that, because the ureters seem'd sound, no calculus, except a very small one, had pervaded them, and they had not been distended with urine; although not only the calculus was small, but the distention of short continuance; yet you may easily conceive of their being affected, by the calculus so far irritating the upper part of the urethra, into which it had been thrust, that the blood, in the first place, afterwards pus, and, last of all the ill smell, with which the urine was infected, seem to have been owing thereto; since we are not at liberty to suppose the blood, or the pus, to have been discharg'd from any other part but the urethra, though we do not read of its having been laid open.

Nor do we read that the brain was examin'd, into which it is to be suppos'd that, upon the suppression of urine, the impure serum had been discharg'd from the blood; and, being grown acrid by a short delay, had brought on that epileptic concussion and death, just as it did, in my opinion, in the two persons, whose histories you have in the twenty second section of the Sepulchretum (*k*); which you see I here follow; and who died, in like manner, from stones of the kidneys, and a suppression of urine, not without convulsions; to omit many other examples of an apoplexy itself being brought on by a suppression of urine, and particularly that of Koenigius (*l*), in a senator whose ureters were obstructed with calculi, and whose kidneys,

(*i*) De obs. med. & anat. epist. 8. n. 14.

(*l*) Lithogenes. human. specim. epist. 2.

(*k*) L. 3. obs. 2. & obs. 13. §. 1.

but the right in particular, were much enlarg'd beyond their natural size, and contain'd a great quantity of small stones adhering to several parts; their coats being dilated, and tumid with a great quantity of serum.

6. As it has been just shown that a pain may be propagated from the bladder to the loins, it would be proper to add, on this occasion, other observations of Valsalva's, which jointly demonstrate the same thing to have proceeded from some other cause; if it did not seem necessary to show, before we quit the subject of the kidneys, that the pain of these parts, and consequently of the loins, is sometimes to be imputed to a cause which lies in the kidneys, indeed, but is not a calculus. A very extraordinary, but not incredible cause, is that of worms, which have been found, not only in the kidneys of dogs, but in those of men also, by many whom Dominicus de Marinis (*m*) speaks of by name; to whom, being in great part taken notice of in the *Sepulchretum* also (*n*), you may add some others refer'd to in the same book (*o*); and those, besides, that are written of by Vallisneri (*p*), or by Alghisi (*q*) to Vallisneri, but particularly after Redi, Vallisneri himself, and Charles Drelincurt (*r*).

Yet, out of all the observers, you will read of very few, and these such as were not, generally, very cautious in observing, who assert that they had seen them within the kidneys even of human bodies; so that if we did not know that they have certainly been found in dogs, and ferrets or weasels, we should, perhaps, in part call their observations into question, and in part explain them differently; upon calling to mind that oblong and round polypos, which was discharg'd from the urethra, after nephritic pains, and had, at first, impos'd upon Sponius (*s*), by the appearance of a worm. In proportion, therefore, as the number of certain observations is more increas'd in dogs, it becomes still so much the more credible, that the same thing may happen in men also. With this view I shall describe what was seen by Valsalva, much in the same manner as happen'd to the illustrious Van Swieten (*t*) also.

7. Valsalva had open'd a dog, for the sake of anatomical experiment, when instead of the right kidney, he found a body which, externally indeed, was very much similar to the kidney, but had a thin glandular cortex beneath the external membrane; to which some sanguiferous vessels were carried; and under this cortex a cavity, invested with a very smooth membrane, pierc'd through with many foramina, which went to this cortex; so that the urine seem'd to flow from thence, through these foramina, into the cavity. In this cavity lay a worm about three ells long, and of the thickness of one of the largest quills which we use for writing.

8. Redi (*u*), indeed, found worms in the kidney, that were thicker than this, but not equally long. Kerckringius (*x*) and I have found them of an ell in length, Vallisneri (*y*) four spans, and Drelincurt longer than two feet; so that for the length of an animal, which was not very thick, to be equal

(*m*) Dissert. de re monstr. a Capuc. & cæt.

(*n*) Sect. hac 22. obs. 23. §. 5. & in schol.

(*o*) Ibid. & in additam. ad eand. sect. obs. 2.

(*p*) Consideraz. int. alla generaz. de' Vermi.

(*q*) Opera del Vallisn. tom. 1. p. 5.

(*r*) Experim. anat. canicid. 3. n. 10. & 16.

& canicid. 11. n. 36.

(*s*) Act. erud. Lips. a. 1684. m. jun.

(*t*) Com. in Boerhaav. aph. §. 1134.

(*u*) Osservaz. int. agli anim. viv. & cæt.

(*x*) Spicileg. anat. obs. 59.

(*y*) Consider. cit.

to about three ells, may seem very surprizing, unless it be much increas'd after death; as I have observ'd to happen in another species of worms (*a*); and as Redi has observ'd may easily happen in this; or unless, as you have it in Drelincurt (*b*), there were two, and one had its rostrum or snout very closely fix'd about the tail of the other.

For there are two in one kidney, sometimes, of unequal length indeed (*c*), as Redi has also observ'd (*d*); but they are represented of an equal length by Blasius (*e*), and these from an emaciated man: of which kind we read in Zacutus (*f*) that another was, in whose kidneys worms, of a white colour, are said to have been, but very considerably shorter; whereas they were red in the observation of Blasius; which is the same colour that they have been always seen to be of in dogs, both by Redi, and Drelincurt: the former of whom sometimes found them alive, the latter always dead; the one only in males, and on the right side, the other in a woman also, and on the left side. Zacutus has said that there were very severe pains in the loins: which Kerckringius, and Boirelius (*g*) testify even to have been signified in dogs, by a perpetual howling; whereas the others, whom I have mention'd by name, say nothing of it.

As to what remains in respect to the origin of these worms; as, for instance, whether those in dogs are of that redish kind which I have describ'd formerly (*b*), as being sometimes found in certain tubercles, not far from the kidneys, and which have sometimes pass'd over into the kidneys, after the tubercles were eroded; in so great an inequality of length it is not easy for me to determine, unless I were, previously, more certainly inform'd of the structure of each. Blasius, indeed, has describ'd, and represented in a figure, the renal worms found by him, as consisting "of a great number of small rings, "curiously join'd together;" but I should suppose that the engraver had added a double head, and eyes, to that picture, from his own imagination. Vallisneri observes that the one he saw was not of the broad-worm species, as it was rather round; but yet that it was not of any different kind, which other authors, as far as he knew, had ever found to be contain'd within the intestines.

This remark of Vallisneri renders the account of their structure, given us by Redi, very doubtful; inasmuch as he represents it to be almost in common with the round worms of the intestines, as describ'd by this very author himself; to pass by those circumstances, which Vallisneri (*i*) has remark'd to differ entirely from this description. But though all the circumstances, relating to renal worms, should be pretty certain and constant, yet the smallness of those which are in these tubercles of dogs, would render the necessary comparison of their internal structure very difficult. Leaving this labour, however, to others who have more leisure upon their hands than I have, I go on, in the mean while, as I have promis'd, to other histories of Valsalva,

(*a*) Epist. anat. 14. n. 47.

(*b*) Canicid. cit. 3. n. 16.

(*c*) Ibid. n. 11.

(*d*) Offervaz. cit.

(*e*) P. 6. obs. med. 12. tab. 9. fig. 6 & 7.

(*f*) Sepulchr. sect. hac. 23. obs. 23. §. 5.

(*g*) In additam. ad eand. sect. obs. 2.

(*h*) Epist. anat. 9. n. 44. & seq.

(*i*) Miglioramenti d'alcune offervaz. del.

Redi n. 13.

wherein he has observ'd the pain of the loins from causes situated on the outside of the kidneys.

9. A virgin, of about four and twenty years of age, falling from a high place, was seiz'd with an oppressive pain in her loins, and a fever. Both of these symptoms grew somewhat mild. But both of them grew violent again after some days; a sense of weight in the cavity of the abdomen being also added; together with a vomiting of a matter sometimes green, and sometimes blackish; the same being discharg'd downwards by stool; and in this manner she died.

While the belly was open'd a sanies immediately flow'd out, which being collected in sponges, weigh'd, when put all together, about eight pounds. The intestines were connected, one to another, by the external coat, yet in such a manner that a pretty thick sanies lay hid in their interstices. However, the intestines themselves, and the stomach, shew'd no disorder internally. The liver was whitish, and had a very thick sanious matter adhering to it externally. But the omentum being annex'd to the peritonæum on the left side, towards the iliac region, discover'd an ulcer in that part.

10. Whatever the reason was, why the internal paries of the belly, towards the iliac region, was hurt by that fall, there, without doubt, so large an abscess was generated, as to discharge this great quantity of sanies. When pus is form'd, that happens which we learn from the aphorism of Hippocrates (*k*); I mean that "pains and fevers" naturally become somewhat milder. But the fresh exacerbation of these symptoms signified the rupture of the abscess; as the effusion of pus into the cavity of the belly was shewn by the sense of weight in that cavity. But you will not enquire after the cause of pain in the loins, when you call to mind the seat of the abscess; as it was in that part of the abdomen, which verg'd to the iliac region; for the fibres of the transverse muscles, which are in this very part, take their origin, as you very well know, from the vertebræ of the loins: and that pains should be felt at the extremities of the muscles (especially when they are tied very strongly to the bone) when their fibres suffer distraction, and erosion, need not be any great matter of surprize.

11. Being about to add, in this place, other observations of Valsalva, of pains raging in the same place, even from a cause plac'd on the outside of the belly and abdomen, it comes into my mind, that I have already describ'd them to you, in a former letter (*l*); and that from the connexion of the appendages of the diaphragm, the action of a cause, which lay hid in the thorax, I mean its action upon these appendages, was explain'd: to which elass also, perhaps the observation of Jacotius, that is to be met with in one of the following sections of the Sepulchretum (*m*), belongs. And if a cause that lies on the outside of the cavity of the belly, is able to do this; how much more will those, which lie either in the loins themselves, or in some part of the belly that lies near to the loins, or is connected to them, be able to effect the same?

You will see these causes particularly and fully recounted, in the Encheiridion of Riolanus, in that chapter from whence they are transfer'd into this

(*k*) 47. sect. II.

(*l*) Epist. 16. n. 40 & 41.

(*m*) 25 obs. 14.

twenty-second section of the Sepulchretum, in the scholia to the first observation which is mark'd with the number thirty-eight; for the same number is through carelessness repeated: and you will see most of them confirm'd, in the same section, by examples; as from a rheumatism of the loins, in observation the twenty-ninth; from serum in the tube of the lumbar vertebræ, in observation the thirty-third: from the erosion of these vertebræ, in observation the thirty-fifth, and fortieth: from small stones, or if you choose rather to have it so, from small bones in the lumbar arteries, in observation the thirty-first: from disorders of the mesentery, in the second thirty-eighth observation, the thirty-ninth, and forty-first, article the first, second, fifth, sixth, and ninth, and observation the first in the additamenta: from disorders of the uterus, in observation the forty-first, article the fourth: from an ulcerated scirrhus of the intestinum ileum, in observation the thirty-second: and, to omit others at present, from disorders of the pancreas, in observation the twenty-fifth, and the second thirty-eighth, and in the forty-first, article the third: and I should likewise add article the seventh, if it were not the same; as article the sixth and eighth are the same with those observations that are just now refer'd to; the twenty-fifth, and thirty-eighth; which are here repeated through forgetfulness. And the pancreas not only affects the neighbouring vertebræ, even of itself, but more frequently than many physicians imagine; as is rightly observ'd by Franciscus Sylvius (n); by the juice which it then sends, in a preternatural state, as the liver does also, into the duodenum, that lies in contact with, and connected to, the same vertebræ, and the right kidney; from whence arises a various sense of pain in many of these vertebræ, but particularly a sense of burning pain; which is frequently imputed to the kidneys, without any cause.

But we must now return to the kidneys themselves, and first as being affected with calculi, if you are willing I should communicate to you my own observations, in the same order I have communicated Valsalva's, according to my promise: altho' as those which are more remarkable, are to be defer'd to other letters, for certain reasons, as you will then see, I shall here subjoin one only; which, though deficient in the history of the peculiar symptoms that had preceded, is not altogether without its utility nevertheless.

12. A woman had died in the hospital at Padua, when she was already in the seventh month of her pregnancy; it being then the month of March in the year 1708.

The belly therefore, and the uterus, were immediately open'd after death, and the fœtus taken out alive, though it died soon after; at which time, happening to be at Padua, I took the cervix of the uterus, which was even then found, and the kidneys, in order to make some accurate observations upon them. It is to little purpose to take notice here at large, of a quantity of mucus within the cervix uteri, and of vesicles which were pregnant therewith, very conspicuous both in number and magnitude, that cover'd the surface of the os uteri. But the kidneys deserve to be describ'd.

For the left, being larger than the magnitude of body requir'd, show its small canals to be thicker than they generally are; and, for that reason,

(n) Vid. extrema scholia ad cit. obs. 38. primam.

very evident to all those who happen'd to be present : on the other hand, the right was so much diminish'd in its size, as not to exceed the bigness and thickness of the ren succenturiatus ; and to the smallness of this kidney, the ureter, and the emulgent vessels, corresponded. And that you may not suppose it to have been thus from the original formation of the body, it was of a colour which shew'd it to be morbid ; and had still the tubuli which are wont to receive the papillæ, but contracted in their diameter, and the remaining substance reduc'd almost to nothing : so that if you took away a calculus, which was not at all red, and not at all of a saffron colour, and which lay in the kidney, and a calculous matter here and there, scarcely any thing would remain.

13. As to what I have said, that this observation could not be without its utility ; I would have you understand it in such a manner, as to suppose that it gives us occasion of examining many things which have been asserted by physicians, when they have treated of calculi, and other disorders of the kidney ; as appears even from that twenty-second section of the Sepulchretum.

And first, although it happen'd to Coiterus (*o*) to find “ the right kidney “ more liable to ulceration than the left,” and tho' it happen'd so in our woman also, yet if you run over this whole section, you will find that out of the kidneys, the substances of which had been ulcerated, or consum'd, the number is greater on the left side, than on the right : and indeed if the more frequent cause of ulceration is to be sought after in calculi, these are, in the opinion of Boerhaave (*p*), less frequent in the right : nor have learned men fail'd to assign a reason for this difference (*q*) ; I mean, because the blood is carried back, from the right kidney, much the most easily, on account of the emulgent vein being shorter, and more at liberty.

And though different authors have accounted for it differently, yet in the fact itself all agree ; as Frederic Hoffmann (*r*), and still more Carolus Pifo (*s*), whom he quotes, and who says, in express words, that “ out of a hundred who labour under a nephritis from calculi, more “ than eighty are “ affected in the left kidney, as is prov'd by experience ;” or indeed “ in almost all nephritic patients ; . . . which is,” says he, (*t*) “ an observation “ made by Dodonæus, as well as by myself.”

Therefore, although in turning over those of the volumes of the Cæsarean Academy, from which I am wont chiefly to take examples in these letters, you will light on some observations, that either describe (*u*) both of the kidneys, as equally consum'd, internally, from calculi ; or (*x*) the right only as being oppress'd with them ; or (*y*) if both of them, the right by far the most ; yet you will have so many of the others, that are proper to be oppos'd to these, and indeed some out of the same volumes ; as, for instance, where (*z*) they describe calculi in the left kidney only, or, if in both of them, ei-

(*o*) Obs. 23. §. 3.

(*p*) Prælect. ad instit. §. 352.

(*q*) Vid. Haller. not. g ad eund. loc.

(*r*) Medic. rat. t. 4. p. 2. f. 2. c. 6. in thes. pathol. §. 6.

(*s*) Obs. de morbis a fer. colluv. f. 4. c. 2. post. obs. 100.

(*t*) In præf. paulo ante theor. 4.

(*u*) Dec. 3. a. 5. obs. 33.

(*x*) Aët. t. 1. obs. 20. & 247.

(*y*) Cent. 1. obs. 27. & cent. 3. obs. 45.

(*z*) Ibid in appen. n. 1.

ther (*a*) more, or (*b*) larger, and such as more considerably affected the left kidney than the right; in one of which observations you will, by the way, remark this, that some parts of those calculi were “of a chrystalline hardness, and a shining smoothness,” or “pellucid.”

From the same books you will have examples (*c*) of the left kidney only being much increas'd in its size, though internally eroded, or affected with some other disorder, or of the left much more than the right: and these things will be, in like manner, confirm'd by two observations of purulent kidneys, propos'd by the celebrated Colchwitz (*d*). But enough of examples at present: I therefore purposely pass over others (among which is even that refer'd to above (*e*), from the celebrated Fantonus) except one which that author has mention'd (*f*) from the observation of du Verney; as it ought not to be pass'd over, in order that a rare cause of a purulent discharge, by stool, may be understood. That is to say, pus proceeded from the intestinum colon, which was eroded by an ulcer of a neighbouring part. And this part was the left kidney.

From these things that have been said, you see, some advantage may be drawn, when dubious symptoms of a renal disorder discover themselves, as frequently happens. For if to others, this also be added, that they are on the left side, they will become less dubious, than if they were on the right side.

14. Eustachius (*g*), moreover, having found, in Bonifacio Corneo, one of the kidneys to be scarcely equal to a small chestnut in magnitude, and the other large; but the former sound, and the latter purulent, as well as turgid with calculi, and sanious matter; suppos'd that the smallness of the former was owing to a deficiency of blood: inasmuch as this fluid was carried in the greatest quantity into the other, where it was drawn by the force, and stimulus, of the disease. If the small kidney was really sound, and the smallness of it did not hide the traces of old diseases, it is not to be wonder'd at, that this great man was oblig'd to have recourse to that explication.

But others are better satisfied with a contrary explication, where the lesser kidney is morbid, as I am also, in the case of the woman in question. The kidney being contracted, the vessels of it are contracted also, as we have seen in the present case. What blood, therefore, cannot now be carried into this kidney, is diverted into the other by the opposite artery; and, by this unusual flow of blood, the opposite kidney is distended. And I believe that the contraction of the one, and its vessels, and the distention of the other, may be, sometimes, so far increas'd, that the latter may grow out into a very great bulk, and the former may seem never to have existed.

That is to say, the sound kidney, if it be firm, is not more increas'd than the influx of blood requires; which must deposit the same quantity of fluid in one kidney, that was before deposited in both. But if it be pretty lax in its nature, and a disease is added to that laxity, it is scarcely to be conceiv'd how

(*a*) Dec. 3. a. 3. obs. 122.

(*b*) Ibid. a. 7. & 8. obs. 122. cum figuris.

(*c*) Cent. 8. obs. 100. & cent. 9. obs. 64. & 2^a tom. 7. append. n. 10. & eorund. tom. 8.

•obs. 89.

(*d*) Dissert. de Valvulis in ureterib. §. 5 & 7.

(*e*) Vid. supra n. 5.

(*f*) Anat. corp. hum. diff. 4.

(*g*) Sect. hac 22. obs. 16.

great an increase it may sometimes acquire. This is shown by that kidney, which the celebrated Valcarengus (*b*) found to be ten times larger than its natural size, and still more by that which is taken notice of in the history of the Royal Academy of Sciences at Paris (*i*), and which weigh'd thirty-five pounds; to say nothing here of another, which was twice as heavy as the last, and indeed more than twice, and which the celebrated Fantonus (*k*) has taken notice of, from the observation of Monginotius. On the other hand, I have a suspicion that the kidney has been contracted by disease, and even so attenuated, and consum'd; in those who have labour'd under pains of the kidney, from calculi, and other disorders; as to make learned men think that they were originally deficient: as, for instance, in a woman, a man, and a girl, whose histories you may see in the Sepulchretum (*l*). For; to omit the man, I mean that merchant, the observation of whom is once and again refer'd to in this section, through carelessness; in the girl, although not the least appearance of filaments, or membranes, occupied the place of the right kidney; yet that place was taken up by the ureter, which still went down to the bladder, from the trunk of the vena cava, to which it seem'd to have been agglutinated, after the kidney was consum'd: and in the woman, instead of the right kidney, was seen "a certain kind of involucrum," the membrane, as I suppose, which, when the substance of the kidney is already consum'd, is taken notice of as remaining behind in the shape of a purse, or bag, by such a number of observers (*n*).

But I should suppose the kidney to have been deficient from the original formation, as Aristotle observ'd even formerly (*o*), in those persons where no disorders of the kidneys have preceded; and no vestige or traces, either of its emulgent vessels, or the ureter, exists; as was the case in the little girl dissected by Poupart (*p*), and in the priest, and woman, dissected by Valsalva, each of whose histories I have already given you (*q*): or if any trace did exist, some other particular things were not wanting, which shew'd that the kidney never had existed; as in that woman, the kidney of the other side was not only, as in that little girl, larger than it usually is, but twice as large as its natural size: and besides this, furnish'd with a double pelvis, and double ureter; so that it seem'd to have been form'd from the beginning, with an intention to supply the functions of its absent fellow.

In a whelp which I dissected at Bologna, in the month of February, in the year 1702, I observ'd another thing; from whence, although neither the ureter, nor the emulgent vessels were wanting, I should, nevertheless, conjecture the kidney to have been wanting from the original formation. For when, instead of the right kidney, I had found nothing but fat, which, in some measure, resembled it, both in bulk, and figure; and the ureter, indeed, join'd with the bladder, but solid like a ligament; and, a little before it reach'd to that fat, suddenly separated into slender and pinguedinous striæ,

(*b*) Dissert. de saxis, acub. & cast.

(*i*) A. 1732. obs. anat. 7.

(*k*) De obs. med. & anat. epist. 8. in fin.

(*l*) Sect. cit. obs. 23. §. 4. sect. 27. obs. 1. sect. 28. in additam. obs. 2.

(*m*) Obs. 23. §. 12. & obs. 27. §. 6.

(*n*) Vid. ex. grat. sect. hac 22. omnes §. obs. 5.

(*o*) De generat. animal. l. 4. c. 4. art. 2.

(*p*) Hist. de l'Acad. R. des sc. a. 1700. obs. anat. 1.

(*q*) Epist. 25. n. 4. & epist. 31. n. 25.

which

which accompanied the sanguiferous vessels; and had seen that the emulgent artery, in like manner, was not wanting on that side, but much more small than it commonly is; and when it had sent out a branch of no inconsiderable size, going away into small ramifications, which only crept through the surface of the describ'd fat: when, therefore, I had seen these things, I observ'd that the emulgent vein, on the same side, although in thickness it somewhat exceeded the opposite, did not, however, receive any ramifications coming from that fat, or at least any that were obvious to the senses; as I examin'd the whole of this pinguedinous body with great care; but that it receiv'd a branch from the nearest lobe of the liver, so thick in its size, that even the left emulgent itself seem'd to be thinner than this.

From this circumstance it was natural to conjecture, that the right emulgent vein had not been created for the sake of the kidney, in this whelp, but for the sake of the liver; especially as it was in a creature who was very found, and healthy, and in whom every thing else was agreeable to the usual course of nature; except that the left kidney was larger than in proportion to the size of the body, inasmuch as this was under a necessity of secreting the whole of the urine; for which reason the small canals thereof were also much thicker, and more evident, as I describ'd in the woman.

15. To return therefore from the constitution of these parts, which is the effect of original formation, to that which is from disease, and to the discourse I had begun; I should suppose that the magnitude of the sound kidney is increas'd by the wasting of the other, in much the same manner as I just now advanc'd; for in the observations of Kerckringius, for example sake, or Drelincurt, already taken notice of (*r*); as one kidney was destroy'd by a worm, and the other larger than it ought to be; there cannot be room for the explication of Eustachius.

But as we see it so often happen, that one kidney not secreting, or not emitting, urine, by reason of its being corrupted, or on account of obstructing calculi, is supplied by the other, and that this is confirm'd by the very increase of it; it is evident that Guy Patin had with reason asserted, as you will read in the Sepulchretum (*s*), the frequent fallibility of this supposition, that when one kidney is obstructed the other immediately ceases from its office: which he has also prov'd by his own observations, and it is easy likewise to conceive, from the observations of several authors; and among these, to omit a great number of others, those of Gregory Horstius (*t*), and Thomas Bartholin (*u*).

If in reading over the histories of Guy Patin, and Bartholin, you should be surpriz'd that, although there was a large and angular calculus in the kidney, no pain had been wont to be perceiv'd there; you will be surpriz'd still more, if you look into other observations, from which it appears, that there neither had been this pain, nor any other of the great number of symptoms attending renal calculi, through the whole course of life, in some persons who had these calculi; some of which observations are in the same part of the Sepulchretum (*x*), where those are that I refer'd to from Bartholin; but

(*r*) Supra, n. 8.

(*s*) Sect. hac. 22. in schol. ad obf. 14.

(*t*) Ibid. obf. 19.

(*u*) Ibid. obf. 24. §. 2.

(*x*) Obf. ead. §. 1. 3. 4.

others may be added besides; as, for instance, that which is extant in the history of the Royal Academy of Sciences at Paris (*y*); although in this man, nevertheless, vomitings were not wanting, wherewith he was attack'd at intervals; and that, in like manner, which I am surpriz'd has not been already added, inasmuch as it was publish'd in the posthumous work of Malpighi (*z*).

But the cause why some one symptom only, and sometimes none appears, may indeed be manifold; as, for instance, when stones, although of a considerable magnitude, are naturally, or by chance, "pierc'd through in the middle like a ring" (for thus we ought to read the words of Eustachius, which are transfer'd into the Sepulchretum (*a*), in an improper manner, where they are confirm'd by an excellent observation of the same author's) a suppression of urine does not happen, as it will not happen likewise, if a passage for the urine, through small canals, as it were, in the sides of the calculi themselves, be left open; as appears in the next history of Salmuthus (*b*), and still more clearly, as the description is illustrated by a figure, in that which Lancisi communicated to Alghisi (*c*). Nor will there be a troublesome sensation in the loins, not even of heaviness, if the calculi increase gradually and slowly, and have not sharp angles; or if they adhere so closely, and are so wedg'd in, to the substance of the kidney, that they cannot be mov'd; especially if that substance be hard and callous, as I shall tell you, hereafter (*d*), that it was in the cardinal Corneli; and as it was also in that man of whom I made mention just now, from the history of the Royal Academy of Sciences, in whom it was found to be cartilaginous.

But it was also hard, in another whose description I have said is extant in Malpighi. And in these there are, in general, no other marks of that disease. And what was the cause of this circumstance in him whose observation is given by Guarinoni (*e*), does not sufficiently appear from the dissection; as it likewise does not in two others (*f*), and in the first, in particular; both of which, nevertheless, show each of the kidneys to have been stuff'd up with calculi, and particularly the left. Yet what, and of what kind, those marks are, for the most part, wont to be, from the presence of which, calculi of the kidneys are properly distinguish'd, although you know very well of yourself already; it will, nevertheless, be of use to enquire, over again, in the writings of the celebrated Scharfchmidius (*g*); for he subjoins examples by which he confirms, that most of them, or even all of them, may be absent sometimes, so that the physicians may have an eye to another disease, and may by no means suspect that calculi are in the kidneys.

Moreover, it is needless to admonish, that causes may arise, on account of which, the pain that was before even very sharp, in the kidney, may cease: that is in consequence of the small nervous branches being either become incapable of feeling acutely, or being consum'd; as is understood from the sixth observation of this section. And as this is the state of the question,

(*y*) A. 1730. obs. anat. 3.

(*z*) Ubi de renib.

(*a*) Sect. cit. obs. 12. §. 1.

(*b*) Ibid. §. 2.

(*c*) Lithotom. c. 4. & tab. 4.

(*d*) Epist. 57. n. 10.

(*e*) Sepulchr. l. 2. f. 1. in additam. obs. 10.

(*f*) Act. n. c. tom. 2. in append. n. 3. & Commenc. Litter. a. 1745. hebdom. 11. n. 1.

(*g*) Ibid. a. 1739. hebdom. 31. n. 1.

it appears of how much importance it is to enquire what symptoms have preceded in patients; and if, at any time, no peculiar symptom of a renal calculus exists, not for that reason to despise the slighter symptoms, or those which are also common to other disorders. But my observations of this disease being found in dead bodies, will better teach us this, though they are defer'd to other letters for this reason; because it does not seem so proper to give them here, where the question is of pain in the loins; as, in these patients, no pain of the loins had discover'd itself.

16. But as to what I have said, that, in the kidney of the woman describ'd by me, the calculus was neither of a saffron colour, nor red; and as to my having taken notice to you, in another letter (*b*), that three white ones were found by me; it is, without doubt, contradictory to that distinction, which was formerly receiv'd by every-one; supposing that stones generated in the kidneys, were to be known from those generated in the bladder by one or other of these two colours. To whom, you see in the Sepulchretum (*i*), that Eustachius has objected this observation: and from the Sepulchretum, also, you will add others; as out of those which are at hand, another next to that of Eustachius (*k*), wherein they are describ'd as being of the colour of white marble; and another (*l*), wherein calculi, found in the kidneys, are said to be of a snowy whiteness: where some have been seen by Valsalva, of a white colour (as they were also by Schroeckius (*m*)) which I have taken notice of in another letter; and some of a black colour, as I have taken notice in this very letter (*n*).

It appears, therefore, that this distinction has either been taken from too small a number of observations, or from some prejudg'd opinion. And, certainly, that stony matter by which it is ting'd with a red, yellow, black, or any other colour, may be mix'd with it when it is in the bladder. From which variety of mixture, it is to be suppos'd that the different facility, or difficulty, of solution, in different stones, happens; and that, for this reason, all hope is taken away from those persons who enquire after a remedy, by which they may be all equally dissolv'd. And we ought, for this reason, to take the greater pains to prevent a calculus being generated, by avoiding those things which I have said (*o*) tend to retard the urine in the kidneys, and by making use of the contrary, especially if there be any suspicion of a calculus being begun. In order to remove which, while it is possible, I would rather use the more mild diuretics, and such as have something of an anodyne nature, than the more acrid ones; as on the one hand, I remember, that before the Monita of Boerhaave (*p*) came forth, a certain gentleman, a fellow citizen of mine, who had had a stone cut out from his bladder, and who was subject to nephritic pains, began to be less frequently attack'd therewith, from the time that he determin'd to drink, on every third or fourth day in the morning, some ounces of warm water, with the addition of a spoonful of syrup made from the juice of violets; and as, on the other hand, I know that diuretics, properly so call'd, have really freed some persons from the com-

(*b*) Epist. 38. n. 41.

(*i*) Sect. hac 22. in Schol. ad §. 1. & §. 2.

(*k*) Ibid. §. 6.

(*l*) L. 1. sect. 10. in additam. obs. 8. ad fin.

(*m*) Act. n. c. tom. 1. obs. 247.

(*n*) N. 2.

(*o*) Supra, n. 3. & 5.

(*p*) Prælect. ad. instit. §. 365 & 387.

plaints; but have very much hurt others: nor will this be surprizing, to those who either attend to what I have hinted above (*q*), of the mucilaginous humour, wherewith the parietes of the tubuli, and the pelvis, are smear'd over; and how cautious we ought to be in removing it; or to the contractions of the same parietes, which, as they naturally follow the irritation of acrid medicines, it is evident must not only stricture the passages to an improper degree, but greatly increase the pains.

I could wish the anodyne virtue of the squil, and its power in appeasing convulsions, hinted at by Hoffmann, and asserted by the celebrated Jo. Gerard Wagner (*r*), in the nephritis itself; even when proceeding from smaller calculi; were confirm'd by a great number of other successful experiments; so as to be not less known among physicians, than the diuretic property thereof: for certainly our Italians also, notwithstanding they are, in general, averse to the use of emetic medicines, such as the pulvis scilliticus is, would not be in doubt to make a proper use of it, in order to prevent a calculus from increasing in its size, in a part from whence it could not afterwards be discharg'd. For by remaining there long, it is so increas'd, as not only to be too large for being dislodg'd, and got rid of, but even, sometimes, so as to equal the kidney itself in size; and it has been known, more than once, to have been of the weight of five pounds, as it is said to have been in a woman of princely rank (*s*). But as, in other disorders, the same remedy has not the same effect, at all times, so in this does it happen thus in particular. At least, I remember Valsalva to have complain'd of this more than once; and to affirm that, in the case of a noble virgin, who had been troubled, for the space of two years, with pains of the kidneys, he was oblig'd to change his remedies in every paroxysm; since those which had given her immediate relief before, were applied to again without effect.

17. Among the other mischiefs, which nephritic tortures bring to women, I do not doubt but abortion, or even the death both of mother and child, ought frequently to be reckon'd. For as the increasing uterus, by pressing the ureters, renders the deflux of the urine through them less easy, and consequently somewhat delays it in the kidneys; if it happen that any woman has a disorder in these parts, which makes her subject to pains thereof; it is without doubt very natural to suppose, that their internal membranes are, from thence more irritated, and that tortures are excited; as it is likewise to conceive that the whole body, and particularly those parts which lie in the belly, being drawn into consent therewith, by means of the nerves, the foetus may easily be extruded from the uterus, by the contractions thereof, before its proper time: or at least the foetus itself, or the mother, who are very frequently unequal to the conflict with violent disorders, may suffer very much therefrom; so as frequently to make it impossible for either of them to escape death.

In regard to abortion, you have, in the Sepulchretum (*t*), the history of the matron describ'd by Platerus. She "having been fourteen times pregnant, had as often miscarried, in the eighth or ninth month of her pregnancy." The same woman had been subject, for many years, to the most

(*q*) N. modo indicato 3.

(*r*) Observ. Clinic. sect. 2. n. 2. 9 & 10.

(*s*) Vid. apud. Pohl. de prostat. calcul. §. 7.

(*t*) Sect. hac 22. obs. 4.

violent pains of the kidneys. And Platerus found “the cause of her pains, “and abortion,” in the kidneys; one of which was reduc’d into the form of a purse, by a waisting of its substance, and the other was very tumid with a large calculus.

And the woman, from whose history I have had occasion to observe this, as well as other things, that she, herself, first died in the seventh month of her pregnancy, and her foetus also soon after, and have already shown you (*u*) what appearance her right kidney had; gives me at present, occasion to suspect; though, being then busy about other things, I did not enquire into the nature of her death; that the pain of her kidney had been one of the preceding or proximate causes thereof. And this I also suspect of another woman, the account of whose dissection was communicated, by Santorini, to me and the rest of his friends; whose observation I shall the more readily give you here, because it also contains some other things, which will not, perhaps, be at all displeasing to you, when you enquire into the structure of the kidneys.

18. A woman, who had labour’d under disorders of the kidneys, being pregnant, at length died in the fifth month of her pregnancy.

One of the kidneys was wrinkled, and contracted; inasmuch as, notwithstanding the cavity of the pelvis was dilated considerably, the substance of the kidney, itself, was much diminish’d in thickness. The substance of the other likewise, although increas’d in length, and breadth, had a very considerable thickness in some parts, though the pelvis was extremely enlarg’d. But this pelvis terminated in a ureter, of so narrow a dimension, that it was scarcely possible to force any air through it. And where the pelvis coher’d with the internal part of the kidney, it was pierc’d through with wide orifices, which communicated with large cells. One of these cells, also, had its parietes perforated with other orifices; into which the air being driven, distended a great number of the small canals, and the emulgent artery at the same time. And these small canals were plac’d upon the arterial branches transversely. However, these cells were fill’d with urine; but the surface of the kidney was made up of sanguiferous vessels, compacted, as it were, into a kind of thickish stratum.

19. They who do not entirely despise making use of morbid constitutions of the viscera, and the kidneys among others, to discover the structure thereof, will not, perhaps, make light of this; from whence they will, probably, suppose it to be prov’d that the small canals, or tubuli, of the kidney communicate immediately with the artery; whether with justice, or not, it is not the proper place for inquiring here, nor for confirming an experiment which I formerly thought of (*x*), in order to discover the structure of the kidneys.

From this history, and others, taken notice of above, I rather recal another to mind, which you will find in the Sepulchretum (*y*), being transfer’d thither from Willis. In this observation a matron is describ’d to us, who had been troubled for many years past, but particularly when she had conceiv’d, with spasmodic affections; in consequence whereof she always miscarried about

(*u*) N. 12.

(*x*) Alvers. anat. 3. animad. 33. vid. et epist. anat. 3. n. 15.

(*y*) L. 1. sect. 13. obs. 7.

the end of the third month, which had happen'd lately also; that is to say, by reason of acute pains frequently returning, especially in the loins, and these troubling her afterwards, also, in a violent manner, and being attended with a vomiting, even almost to the very last day of her life, which was the thirty-fifth day after miscarriage. When the body was dissected, and examin'd, Willis did not doubt but the cause of the pains had consisted in water found within the cranium, which had fallen down from thence, through the nerves, into the center of the mesentery, and torn asunder the membranes, which he found to be separated from each other, in that part, by interpos'd air, just as if they had been blown up by a butcher.

I confess I am not one of those who deny that water, overflowing the brain, may excite spasmodic pains. Yet it is, nevertheless, more natural to conceive that in a body, which he says had very soon putrefied, this air that was interpos'd betwixt the membranes, had rather been recently extricated by putrefaction, than that it had existed in the living body. What are we then to suppose? Perhaps another cause might have been found in the kidneys, that you might have added to this water. For he says that the kidneys were pretty found; but that one of them "was of an unusual figure," inasmuch as "it was divided into many lobes, like the kidney of a calf." For call to mind what Ruysch (z) says he had met with more than once:

After intolerable pains of the loins, he found, instead of calculi, which he and every one expected, only an unequal surface of the kidneys, as in human fœtusses, in calves, and in oxen. And he confesses that, as the circumstance itself was new and unheard of to him, so also he had not found out, by what means so violent a pain, and a frequent discharge of bloody water, could arise from a structure of this kind. For although this discharge of bloody water is not mention'd by Willis, yet that internal disorder of the kidney, which would either be the effect, or the cause, of this inequality of surface, might not as yet have reach'd to such a height, as to cause a discharge of blood, together with the urine. We are exhorted by Ruysch to enquire what kind of disorder this is, but of what nature it is it will not be easy for any one to conjecture, before he knows whether all adults, who have this inequality of their kidneys, are troubled with pains of these parts.

20. Therefore, if the things which have been said by the more ancient writers are attended to, any one will think, at first, that this is not true. For as Aristotle (a) has asserted, "that the kidneys of men are like to those of oxen, inasmuch as they consist of a composition of many very small kidneys, and are not equable;" it may seem that they were found so in the greater part of bodies at least: yet that the greater part of men were, at that time, troubled with pains of the kidneys, cannot, I think, seem probable to any one.

But if we suspect that he was induc'd to make this assertion, from the inspection of fœtusses, and young children; which suspicion is hinted at in the annotations to Eustachio's book of the kidneys (b); we must set aside Aristotle, and enquire how often the same has been seen by others, in what subjects

(z) Adv. anat. Dec. 1. n. 9.

(a) De partib. anim. l. 3. c. 9.

(b) Ad c. 3. in fin.

they were seen, and by whom. Eustachius (*c*), who examin'd as many kidneys as any one whatever, has told us, that he had met with this appearance in one or two only; and although he does not say that they had labour'd under any renal disorder; he seems, nevertheless, to hint it in some measure, when he says that the kidneys of one "were of a very remarkable magnitude" also, and one which far exceeded others;" and when he, in another place (*d*), denies that this appearance would be found, "unless we have either got a body whose kidneys abound with tubercles, or nature has deviated from her own laws in forming them."

And as this is said to happen "very seldom," by so skilful an anatomist, it would be very surprizing it should have been, afterwards, asserted by Veslingius (*e*), that the kidneys, "however, frequently retain, in adults, that inequality of surface, as if made up of a number of glands compacted together, which they exhibit in the fœtus;" if it were not more just to interpret him thus; that is, by supposing him to have said *sæpius*, not so much to signify frequently, as by way of comparison with what he had said before, which is certainly more rare; I mean, that one kidney is sometimes found instead of two; more just, I say, than to blame him, as Riolanus (*f*) does. Against whom, when denying that he "had ever seen it," Dominico de Marchettis (*g*) so defends Veslingius, as to affirm, that he had demonstrated it "two or three times," in this theatre. But neither of them has mention'd a word, whereby we may understand whether the patients, in whom they were found, had been healthy or diseas'd. Nor, indeed, has Diemerbroeck (*b*), who once saw the same appearance, mention'd any thing to this purpose: nor others, whom I designedly omit; especially those who are more modern than he, if you except two, one of whose observations you have in the Sepulchretum (*i*), and the other in the Bibliotheca Anatomica (*k*).

The latter affirms, "that he had once had an opportunity of seeing this lobulated state of the kidneys, in a young man of nine years of age, where it was very evident, and manifest; this viscus being, in the mean while, affected with no disease whatever." And the former, "in a girl of ten years of age," who was troubled with very severe pains of the belly, which brought on convulsions and vomitings, whereby she was at length carried off; although he observ'd several morbid causes in other parts, nevertheless found the kidneys to be very hard, and one of them "of an unusual figure, that is to say, fissur'd into several lobes." But if you set aside this last on account of these several causes, and both of them on account of their age, not being quite adult; for it would not be very surprizing if, in some bodies, both the kidneys, or one of them at least, should lose that inequality which is natural to children, somewhat later than usual in life; out of the other observations that I at present remember to have read, there are no more than four of this kind, one of Ruysch's, another of Petruccio's, a third of Mauchart's, and the last of Trew's. And from the two first observations, if

(*c*) C. cit.

(*d*) C. 42.

(*e*) Syntagm. anat. c. 5.

(*f*) Animadv. in cit. Veslingii locam.

(*g*) Anat c 5.

(*b*) Anat l. 1. c. 18.

(*i*) L. 1. sect. 13. obs. 3. in additam.

(*k*) Tom. 1. p. 1. in adnot. ad c. 1. Malpigh. de Renib.

we attend to some circumstances that were join'd with them, we shall conjecture, that they, in whom kidneys of this kind were found, had labour'd under disorders of the urinary passages.

For Ruyfch, formerly, before he gave us those two cases which furnish'd me with an occasion of considering these things, having found the same structure of kidney in an adult; although he has hinted nothing in regard to his diseases, in the delineation of that kidney (*l*); nevertheless represented the upper tract of the ureter to us, as being wider than it generally is in its natural state, in those who never have been affected with renal disorders: and Petruccio, when in the second table of his *Spicilegium* (*m*), he represents monstrous kidneys; that is, kidneys "consisting of a great number of glands, "wrap'd up together like a cluster of eggs;" represents the pelvis of the right kidney as being more wide, and more protuberant, than is natural; and the ureter of the left, according to what himself says, as being "monstrous, "both in respect to thickness, and to largeness." And in the observation of Mauchartus (*n*), there is no need of conjecture to make us suppose that the old man, who had his kidneys "very large, and unequal, like the kidneys "of oxen," had labour'd under many and considerable disorders of the urine, and the parts destin'd thereto. For it is certain that he had been nephritic for some years; that after this an almost perpetual ischury had succeeded, and then, an incontinency of urine at intervals: and that within the ureters, which were distended like the *intestinum ileum*, urine was found like "buttermilk;" whereas the pelvis, on both sides, from whence they proceeded, was equal to the capacity of an egg: and, finally, that within the bladder, which was contracted, thick, and, in a manner, callous, two stones, one of which was large, had been contain'd; not to mention that many had been formerly discharg'd.

So, also, another old man; in whom both the kidneys were seen, by the celebrated Trew (*o*), to be "remarkable on account of their manifest divisions into lobules, as, at other times, generally happens in children only;" had been for a long time, when living, subject to calculi of the kidneys, which he sometimes discharg'd, in conjunction with bloody urine, till by a second suppression of urine in the bladder, he was carried off. Now if you should ask me what I have observ'd; although as often as ever I have happen'd to light on kidneys of this kind, it was in poor people, and those, for the most part, unknown; and though, for this reason, it was either impossible to know at all, or at least satisfactorily, to what disorders they had been subject while living; yet this I will say, that from some marks it is allowable to conjecture, just as in the observations of Ruyfch, and Petruccio, that none of them had been totally free from disorders, in which the urinary organs were concern'd. Which you yourself, also, will, I hope, easily understand, when you have consider'd these histories which I subjoin, but consider'd them in general; for I shall so dispose them, that you will see these marks, or tokens, to be more and more increas'd, as you proceed; and, from more slight, to become gradually more violent.

(*l*) Obf. anat. chir. 80. fig. 64.

(*m*) De struct. capsular. renal.

(*n*) Eph. n. c. cent. 8. obs. 26.

(*o*) Commerc. Litter. a. 1743. hebd. 33.
n. 3.

21. Some of the viscera, and the head, of a woman who died in this hospital, were brought to the college, at the time I was teaching anatomy, in the year 1726.

The medullary substance of the cerebrum was brown, and mark'd with frequent bloody points: the lateral ventricles were not free from water extravasated within them: the cerebellum was very soft.

Both in the cavity of the thorax, and of the belly, was there some water, which was very foul. The tubes of the uterus had their larger orifice shut up, in consequence of being firmly agglutinated to the ovarium, at that extremity. Both of the kidneys were unequal in their surface, and variegated with white spots, where the surface subsided; so that you might easily perceive this inequality not to have been natural. And the urinary bladder was internally red.

22. I demonstrated the parts of a certain old man, and particularly those of the belly, to our students, in the same hospital, about the end of the year 1742; when among them, I remark'd these to deviate from the usual appearance of nature.

The tunica vaginalis of one of the testes contain'd a pretty large quantity of water, and that turbid: and from the albuginea, which invest'd the testicle, near to the superior globe of the epididymis, was prominent a roundish body, of the same colour with the albuginea. The great artery, where it divided itself into the iliacs, contain'd little bones within its coats. But this was nothing when compar'd with the splenic artery, which, from its beginning quite to its entrance into the spleen, consisted, almost universally, of bones; and was besides this, much more wide than is usual. Yet the spleen was, as far as appear'd to the senses, in a sound state. The gall-bladder was less than it naturally is. The kidneys were small in proportion to the stature of the man: and although they seem'd to be found internally; yet externally their surface was unequal. The urinary bladder was large, and had very thick parietes, such as there generally are in those who have labour'd under a difficulty in their urine, from a calculus, or from any other cause.

23. Another old man, to appearance of sixty years of age; and so very beggarly and poor, that he even pick'd up a sorry sustenance from the outsiderrinds of melons, which were thrown out into the streets, or any thing else of that kind; had come, once before, into this hospital, on account of a fever, and a sense of oppression in the thorax, which were accompanied with a difficult respiration, a weak pulse, and a continual cough; whereby what is commonly call'd a catarrhus matter was discharg'd. When he seem'd to himself to be somewhat reliev'd, he went out again into the streets, and not long after came to the hospital again. Last of all, about the middle of January in the year 1747, he return'd so emaciated, and so broken down, by disease, cold, and hunger, that he died a little after coming in.

I made use of this man's body, in my public demonstrations, till I could supply myself with a better. I therefore examin'd the viscera of the thorax and belly. To speak then first of the thoracic, from whence you may judge of the cause of the principal disorders, in this man; the thorax, as well as the pericardium, had a small quantity of water extravasated in it. But the lungs were strongly connected to the sides, and the back: and, indeed, the

right lobe, when it was drawn away, left a kind of opaque, thick, firm, and equal coat behind; adhering to the parietes of the thorax; extended quite from the lower part beyond half its length; and from the spine almost to the sternum; which being pull'd away at one extremity, and after that from the sternum, follow'd all together: this membrane neither belong'd to the pleura, nor to the membrane of the lungs, for both of these still remain'd in their situations; I therefore suppos'd it to be of that kind which I have already (*p*) explain'd to you. The lungs themselves were not extremely sound; and something hard was even perceiv'd within the upper part of one of the lobes.

But there was much greater mischief in the heart. This viscus was twice as large as it ought to have been: yet it did not contain blood, but polypous concretions only, and these small and few. But as both the ventricles were dilated; the parietes of the right were very thin, as those of the auricle, on the same side, were also; on the other hand, those of the left ventricle were all thicker, and harder, than is natural. The valvulæ mitrales themselves were enlarg'd also, very thick, and tuberos, on their lower edges. And the sigmoid were less soft than is natural; but the semilunar were still less flexible than them: and, indeed, one of these, in a part of its lower circumference, was already bony.

The great artery was wider than natural before its curvature; and, on the whole of its internal surface, was distinguish'd, here and there, with white spots, as the internal surface of the iliacs was also. Some of these spots were prominent on the internal surface: and these were very hard and bony; especially where one of the inferior intercostals took its origin, whose orifice, happening to lie in the center of the spot, which protuberated in a circular circumference, had been so streighten'd on this account, that together with the spot, it at first sight resembled a kind of lenticular gland, of a large size. And since I have made mention of the iliacs; before I add the other circumstances which related to the belly, I will not conceal this, that all the iliac arteries were tortuous, just as we see the splenic to be: but that the iliac veins, the first only, that is quite to their partition, were affected with a kind of corrugation, as it were, so that it was with difficulty you could extend them.

The viscera of the belly shew'd these marks of disease. The stomach was large, although it contain'd but little; and being without rugæ, was internally of a brown colour, in several parts, to a considerable extent, from the middle towards the left side: and still more towards the œsophagus; and there somewhat more deeply. The whole convex surface of the liver, except a little space on the right side, and at the lower part, coher'd firmly with the septum transversum: but in that upper surface, the substance of the liver was hollowed out with an hydatid, the diameter of which was equal to a finger's breadth. And the convex surface had its membrane of a whitish colour in one place, and in the midst of that whiteness it was become bony for a little space. The spleen itself was somewhat lax, and larger than natural in its thickness, rather than its length, or breadth; whereas the splenic artery, nevertheless, seem'd to be somewhat wider than even this increas'd thickness requir'd.

The glands of the mesentery occur'd here and there, though in a man of that age; and many of them were of the bigness of a bean: yet if you touch'd them, or examin'd them, after being cut into, you could not be in doubt that they were free from disease.

But the magnitude of the kidneys, which was less than that of the body in proportion, and still more the surface of them, differ'd from what I have been generally wont to see. For on their posterior surface, they were equally convex, as on their anterior; both of them being unequal, and, in some measure, tuberos; but especially in the left kidney. In the left, also, were certain depressions, as if from cicatrices. And the orifices of the ureters were seen to be somewhat larger within the bladder, than they naturally are; the bladder itself was internally reddish, and distinguish'd with sanguiferous vessels, running here and there, as if the vessels had been fill'd with a colour'd wax; and externally it was furnish'd with redder fibres than it generally is.

24. A rustic old woman, who was of a small stature, and immoderately lean, died in the space of two days, as was said, of old age; but she had labour'd under a difficulty of breathing, although without a cough, or any expectoration whatever: which remark I make, that you may know this to be all it was possible for me to learn of her diseases; not because I examin'd any other viscera, but those of the belly. For, although the body of this woman was also brought from the city, into the theatre, when I was teaching anatomy in the year 1740; yet, when I came to the thorax, I was furnish'd with a better, or at least with a larger body; the dissection of which more effectually answer'd my purposes.

The abdomen, therefore, of this old woman being open'd, all the other parts were found, and these only were found to be preter-natural in their appearance. The large artery, from the diaphragm, quite to all the iliacs, was universally unequal from yellow bony lamellæ; and disfigur'd, besides, from a thickish humour; which was brown, and of a bloody colour, and adher'd, here and there, to the internal coat; from whence, when broken through, and ulcerated, it had distill'd betwixt those lamellæ that lay round about. A disorder of this kind being also propagated into the very short trunk of the celiac artery, had, without hurting the other branches of it, so far extended itself into the splenic artery, that, although it was universally wider than it naturally is, and had its coats thicken'd; and had, in particular, so many and so considerable flexures, that I do not remember to have seen more, or larger, therein, at any time; and, for that reason, seem'd to be, at first sight, what it really was not; it was, moreover, hard at the places of its flexure, and not without ossification. The spleen, to which it went, was found, and, though but small, corresponded very well, in proportion, to the size of the liver, and the other viscera; and even to the whole body. However, the trunk of the hepatic duct was larger than it generally is. The uterus, on the other hand, which we found very much inclin'd to the right side, had so narrow a cavity, that I certainly never saw it narrower in an adult; yet the vagina was not small, and the skin, being rugous above the pubes, shew'd that the woman had brought forth children.

Both of the kidneys were of an unequal surface, almost as they are in the foetus; and not only the pelvis, and two pretty large tubes which join'd to it, were prominent on the outside of the kidney, but many tubes also of a smaller size, which went to one or the other of these large ones. All which were somewhat wider than they naturally are, as the ureters were also, and especially on the right side. But the right kidney was much less than the left; and although internally, as far as I could judge by my senses, it was not morbid, yet when dissected it had a very ill smell. And the right ureter open'd into the bladder with a much wider orifice than it generally does, and with as much wider orifice than the left; so that the woman seem'd to have labour'd under disorders, of the urinary passage, more on the right side, than the left. Then, also, it was perceiv'd why the bladder could not well have been distended, by blowing in air through the urethra, inasmuch as a part of it was diverted by that large orifice, into the ureter, and even the pelvis of the kidney (as I plainly saw) and went out where the pelvis had been cut into.

However, the internal surface of the bladder was, almost universally, mark'd with sanguiferous vessels, and the small tumid branches thereof, which were of a blackish colour; and, indeed, the whole lower part of the bladder was universally black, to a considerable degree.

25. To these I would have you add the observation upon the stable-keeper, which I have describ'd to you already (g). For from hence you will see what were the disorders of the bladder, and ureters; and from the others, that the surface of the kidneys was unequal. Nor is it of any importance, nay, perhaps, rather furthers my purpose, that I observ'd certain disorders in those kidneys besides. For I do not think we are to inquire here, whether the injury of this surface alone, brought on those very violent disorders that are spoken of by Ruysch (r). I should perhaps believe, if I could admit of what was suppos'd by Riolanus (s), that the surface of the kidneys; instead of being unequal, as it is in infants; is, after seven years of age, or sooner, form'd into an equality; because a fleshy cortex is thrown around it by an aspersión of blood: a cortex which is somewhat livid, as thick as a man's little finger, and surrounds all those tuberosities which, of themselves, make up the substance of the kidney in a child. For in the foetus, also, the cortex exists in the same proportion, and composes the surface of the kidneys; and besides, all the kidneys of adult persons, whose surface was tuberos, would be small, which is what I have not always seen: and that delineation of Ruysch, which is refer'd to above (t), is diametrically repugnant to the supposition.

Yet, on the other hand, we are not here to suppose, that the kidneys were so much diseas'd, as in some of the observations of Eustachius (u); and Litre (x): in which, not only the kidney was externally full of tubercles, but had its substance, also, greatly decreas'd, or quite consum'd; the place thereof being occupied by a sandy matter, and the pelvis being fill'd with innumerable little stones, or a matter of that kind; and the beginning of the ureter, in fine, being quite stop'd up by a calculus of no small magnitude. For if

(g) Epist. 4. n. 19.

(r) Supra n. 19.

(s) Animad. cit. supra ad n. 20. & Anthropol. pogr. l. 2. c. 26.

(t) N. 20.

(u) De Ren. c. 45.

(x) Hist. de l'Acad. R. des sc. a. 1701. obs. anat. 5.

In one or the other of these cases, those symptoms had preceded, which are spoken of by Ruysch; for in neither of them was there any thing of this kind, not even in the time immediately preceding death, which is very surprising; certainly nobody would have been at a loss to assign a reason why they should happen, as they, on the contrary, did in the observations of Ruysch.

Now if besides the external tuberosities you suppose any thing on the surface, or internally, which we may remark by attentive inspection and observation; as in almost all our histories; from whence it may be conjectur'd what cause of inequality had preceded, and what cause was capable of bringing on the appearances of this kind; as well as the pains, and the discharge of bloody urine; perhaps something will seem to be pointed out, which is not immediately contradictory to probability.

Suppose then, that many of those cavities fill'd with serum; which I have describ'd to you, in a former letter at large (y), and one of which was even then remaining in the stable-keeper; had previously existed in the surface of the kidney. By reason of this serum, being sometimes very acrid in its nature, the kidney might not only be stimulated, but some sanguiferous vessel eroded, from whence a discharge of bloody water, and pain would arise; and this pain might also happen to be increas'd from a quantity of serum, which both distended and overloaded the part. And when this serum is dissipated, I have shewn that cicatriz'd spots and depressions remain behind; and these in one of the histories produc'd (z), not altogether obscure: between which frequent depressions, the uninjur'd substance of the kidney being, here and there, prominent, will render the surface unequal, and resemble a kind of tuberosity. Here then you have what came into my mind, upon an obscure and very difficult question. But I would have you suppose it to be advanc'd only for the sake of example, and by way of stirring you up to invent a better hypothesis: nor indeed am I sufficiently pleas'd with it on many accounts, but particularly because I am afraid, lest that inequality, which was seen by Ruysch, was different from what has been seen by me, and explain'd in the best manner I was able. Since, then, we have consider'd the cause of pain in the loins, as the effect of a disease in the kidneys; first from calculi, and, after that, from other causes; let us now consider it as arising from the disorder of other parts also; and that by proposing an observation or two.

26. A carman of Padua, betwixt thirty and forty years of age, who was before healthy and robust; except that he had labour'd under the lues venerea; having by chance fallen down, so that the wheel ran across his belly as he lay, was seiz'd with such severe pains in his loins, and back, that he was oblig'd to confine himself to bed, for eight months together; the physicians, whom he had sent for in pretty great number, not being able to be of any service to him for these pains. At length when the celebrated Valisneri had come to him, and had observ'd the patient to complain of violent pains of the loins on the left side in particular; by applying his hand to the side of this very part, he perceiv'd a pulsation as from an aneurism; and,

(y) Epist. 38. n. 39. & seq.

(z) N. 21 & 23.

for that reason, prescrib'd such things, as would have tended, perhaps, to preserve the patient for a very long time, though not to cure him.

After that this place swell'd: the tumour extending itself pretty wide, and raising up even the ribs that lay nearest to it. An œdematous tumour, in the mean while, had occupied the whole leg and thigh of that side. As the patient, however, had a good appetite, and ate very plentifully, and the tumour consequently increas'd, a very unskilful surgeon took upon him to be of a quite different opinion from Vallisneri; and not only to apply such things as tended to bring on a suppuration, but even, when, from the use of these things, vesications and chops had appear'd in the skin of the loins, to make an incision therein. This incision was follow'd, on the succeeding night, by a rupture of the tumour, which brought on an immediate profusion of blood to a very great degree; the consequence of which was a loss of strength and voice: so that within a quarter of an hour after the rupture, he departed this life. On the day following, which was the fifth of November, in the year 1720, Vallisneri related these things to me, and beg'd of me that I would be present at the dissection, together with him, which was perform'd by our Vulpus.

The abdomen being open'd, the aneurism came into sight, a larger than which I never saw. It almost occupied the half of the abdominal cavity, being plac'd longitudinally. For extending itself from the diaphragm to the pelvis, it took up all the space that there is from the right side of the vertebræ, to the left side of the distended abdomen; the spleen, the stomach, the intestines, the mesentery, the vena cava, and the left kidney, being so far driven towards the right side, that even this kidney lay in the umbilical region. The aneurism was then of an oval figure: when fill'd with blood it had, without doubt, been of a spheroidal figure: yet it was, even then, stuff'd up with a very great quantity of blood, which had concreted round about into polypous laminæ; but was so far still grumous in the middle, as to resemble the consistence of a pulstice. And after all this was taken away, we then observ'd the following things.

The aorta, where it first came down into the belly; as it began, in that part, to be immediately dilated in an anterior direction in a small degree, and towards the right side; not more than so as to admit of a clench'd fist of a moderate size; expanded itself so much to the left side, that it seem'd to make up the anterior and lateral parietes of the describ'd aneurism: which, in that part, communicated largely with the cavity of the aorta, betwixt the appendices of the diaphragm.

The lateral parietes, when they had come to the posterior parts, immediately terminated there; and their termination was very closely agglutinated to the parts which the aneurism had not remov'd from thence: for which reason there was no peculiar posterior paries to the aneurism; but the very parts themselves stood in the stead of a paries. And of these parts, those which, by reason of their bony nature, could less yield to the strokes of the in-rushing blood, were themselves, also, affected with a caries, the periosteum being eroded; that is to say, the lower rib, and the hollow surface of the os ilium: and the vertebræ were in a still worse state.

For the transverse processes of the lumbar vertebræ, on the same left side, were either already broken through by caries, or could be easily broken by

a slight pressure of the finger alone : and the bodies of the lowermost vertebra of the thorax, and the two lumbar which lie nearest to that, were hollow'd out to a very great depth, and in great measure consum'd ; which circumstance the more readily occur'd to the eye, because those thick cartilaginous ligaments that lie betwixt the bodies of the vertebræ were, even then, all in their proper situation, prominent, untouch'd by disease, and of a beautiful whiteness : and the depression made by the destruction of the vertebræ, render'd their prominences more striking ; as, on the other hand, their prominences better show'd us how much the vertebræ had been consum'd. All these things, therefore, which came immediately into view, upon taking away the blood, being sufficiently examin'd ; we turn'd our eyes to the viscera of the belly, and were surpriz'd to find them all sound, in spite of so great an inversion of their order.

In the thorax also, we found nothing preternatural, except that the pericardium contain'd a little more water than it generally does. For as to the lungs appearing to be very white, just as if the blood had been wash'd out of their vessels, by frequent injections of water ; this we did not doubt was owing to the blood flowing into the ruptur'd aneurism, where there was no resistance, in the latter part of life.

27. Many things which I might have observ'd, in regard to this very large aneurism, I purposely omit ; and those things, in particular, that I hinted at before, when I was speaking of other aneurisms. I choose rather to observe two things here, one of which you will have in the latter part of this letter (a) ; and the other relates to the suspicions of aneurisms, after pains of the back and loins ; which have been equally troublesome, and long-contin'd ; that were not found out in the living body, at one time ; and, at another time, what is still more surprizing, even in the dissection of the body after death.

To speak first of the latter : read over again, very attentively, some histories that are transfer'd into the Sepulchretum, in more than one section ; and even into this twenty-second : that is, under observations the thirty-fifth and fortieth. You will see that after pains of this kind, which were, at length, succeeded by a sudden death, in one of them "two vertebræ of the loins were "found to be corroded ; one with a rupture of the aorta, and vena cava, "under which they lay ; and that, by this means, a great effusion of blood "had been made into the belly, from both of these vessels : "and in the other, you will read that there was found "a kind of putrid, blackish, and "corrupt flesh," which had so eroded the spine, in the abdomen, "to the "length of two spans, and to the breadth of two hands, as to make it contain an ulcer of a cancerous nature, of the bigness of a man's fist ; and "that the whole of the spina dorsi could be easily broken by a slight stroke : "and, finally, that it had, at last, also, corroded the vena cava itself, where "it ran down upon the spine ; the blood of which, by getting through the "diaphragm, that had been perforated by the same putrid flesh, had obstructed the motion of the lungs, and brought on death."

The first of these disorders is suppos'd to have been the *tubes spineæ*, describ'd by Hippocrates : the second, a very large and putrid tumour of the pancreas. And although I do not deny this, I nevertheless suspect the most considerable part of the tumour to have been from a dilatation of the large vessels. Nor am I altogether without a suspicion of this kind, when I, soon after, read in the second forty-second observation ; for the number is repeated through carelessness ; when I read, I say, that after a constant and long-continu'd pain, about the region of the os sacrum, there was found, “ about “ that region, in the part where the vena cava is bifurcated, a large abscess, “ in which was contain'd a fœtid matter, and a coagulated blood.” And also, “ that the os sacrum was so corroded, and destroy'd, in this part, that it “ could be very easily drawn out, and rub'd into pieces, with the fingers.”

But I should suppose there was still less danger of my being deceiv'd, in my suspicion of the observation, which is the first in the Additamenta to the twelfth section of the fourth book. For therein we read of a man, who had been long afflicted with violent pains of the whole spina dorſi, and who was found, about a quarter of an hour after having din'd with his family, lying upon the ground, and dead ; the spina dorſi being broken asunder, which they suppos'd to have, probably, happen'd to him, while he stoop'd down to lay hold of the chamber-pot. From the belly, when open'd, a great quantity of blood immediately burst forth, wherewith the whole cavity of the thorax, on the left side, was fill'd. And there was, likewise, a very large tumour, which reach'd from the sixth vertebra of the back, quite to the first of the loins, and which “ appear'd to be fill'd with a very great quantity of flesh, of a cancerous nature, macerated in its substance, and cover'd over with a small quantity of pus, and coagulated blood.” The tumour was contain'd in “ a very strong membrane, that had obtain'd the thickness of a crown-piece, but “ was torn near to the first vertebra of the loins ; which was, in part, destitute of its periostium : so that the two last spurious ribs no more coher'd “ to the spine.” Moreover, “ the six inferior vertebræ of the back, and the “ first of the loins, were entirely destroy'd by a caries, as if eroded by “ worms ; so that, in this place, the spine was without any solidity, or “ strength,” and, for that reason, easily broken through. “ The diaphragm “ itself was perforated so as to admit of two fingers join'd together. The “ emulgent vein of the left side was also torn asunder.”

I could wish any mention had been made of the great artery, as is made of this vein ; as that artery must have adher'd to all these rotten vertebræ : for from thence I might either have confirm'd or reject'd my suspicion. You have seen that, in my observation (b), the vertebræ were very deeply hollow'd out ; and, in one of the observations refer'd to, so corroded, that the spine might be broken with a slight stroke : and in this last you see that it was really broken after erosion. And you perceive what I may suspect from mine. But this is beyond suspicion, that from a large aneurism adhering to the spine, this mischief may, besides others, be brought on ; I mean that the spine may be broken ; for there was not much wanting to compleat this accident, even in our carman.

However, lest you should suppose all my suspicions to relate to those observations only, that are extant in the *Sepulchretum*; at least turn to that which being publish'd, amongst others, by a very eminent man, many years after the second edition of this book; or rather, which being (as far as I can understand from the *Acta Helvetica* (c), wherein the same history is) newly form'd by him; tells you that there had been a very considerable tumour in the side of the loins, and the left hypochondrium, "from a very large globular, and tense body, occupying almost the whole side of the abdomen;" which, when cut out, and ruptur'd, "pour'd out a great quantity of brown cruor, wherewith it was fill'd, of a yellowish substance, spongy, and form'd into lamellæ, that lay one upon another."

But as the left kidney adher'd externally to this body, which was itself situated behind the left tract of the *intestinum colon*, within the duplicature of the *peritonæum*, and even, in some part of it, "penetrated into that bulbous body;" it seem'd that this same body was a part of the kidney; that is to say, a part enlarg'd to an incredible degree. I, however; which I take the liberty to say, with a desire of finding out truth, and not with a desire of dissenting from others; suspect it to have been an aneurism, not only from its situation, or from the concretion of the blood therein, in so large a quantity, and the formation thereof into lamellæ, lying one upon another; but, finally, from this circumstance also, "that a living animal was suppos'd to exist" in the man's belly, while living; which seems to argue that some pulsation was perceiv'd: and I suppose that the aneurism had, by its increase, vitiated a part of the neighbouring kidney.

Not much unlike this suspicion of mine, was the judgment of the celebrated *Nebelius* (d), in regard to a roundish tumour; which, being annex'd to the left kidney, had been said "to consist, internally, of a great number of coats, and to be fill'd with blood and tartareous matter: for he thereby knew it to be an aneurism of the emulgent artery. And, indeed, he has added the case of a celebrated physician, which may, in great measure, be compar'd with that which was just now consider'd by me. For the same left side being affected with pain, at first of the nephritic kind, and after that of the rheumatic, as was suppos'd; and the physician being suddenly carried off, upon the pain having become more violent all at once; it was found, that the blood, which had been discharg'd into the belly in great quantity, had proceeded from the ruptur'd aneurism, which protuberated in the same side of the belly, under the annex'd *intestinum colon*; being equal in magnitude to the head of a child of three years old. And "in this hollow tumour, when cut into, which was distinguish'd with internal membranes, and fill'd with coagulated blood, adher'd the left kidney in a putrid and flaccid state."

But while I take notice of these things, I would not have you suppose from hence, that I am quite a stranger to those internal abscesses, whereby not only a pain of the loins, os sacrum, or *spina dorsi*, may be excited, but a caries of the *vertebræ* also may be brought on. For I know, to refer to those I have read of in the more modern books, that abscesses have been found in that

(c) Tom. 1.

(d) Eph. n. c. cent. 9. obs. 59.

part of the mesocolon, which many call the mesorectum (a word that is unlearnedly compounded) in those whose symptoms; and among these "pains within the os sacrum;" are accurately describ'd in the *Commercium Litterarium*. I know, likewise, from the Acts of the Cæsarean Academy (e), that they have been attended with pains of the loins, and back; in whom, after death, large internal abscesses were found, together with a blackness, either of the lower lumbar vertebræ, and a caries, which had broken down one half of the os sacrum into little pieces; or a similar disorder of the first lumbar, and the last thoracic vertebra.

Yet I cannot forget either the merchant, who having labour'd a whole year, under a very great pain of the spina dorſi, had an aneurism, as Ballonius (f) has asserted, in the aorta, where, lying upon the vertebræ of the loins, it is divided into the ilacs; or that nobleman who had been afflicted with a very violent pain of the back, in whose aorta was, likewise, found an aneurism, agreeably to the diagnosis of Vesalius, which I have already commended (g), and which was really surprizing at that time, though easily imitable now; and that not without a caries of the neighbouring vertebræ, and a disorder of the ribs. And as long as I shall call to mind these, and other examples like these, which have frequently offer'd themselves to others, and to me also, I cannot help fearing (where descriptions of abscesses of this kind, found in those places occur, so as to leave the mind in suspense) lest an aneurism should have lain hid under the name of an abscess.

Thus far of suspicions in dissected bodies after death.

28. And in regard to those which have happen'd to me in living bodies; to omit others; I will mention two patients, to whom I myself had also given advice, when I was in the place of my nativity, against violent and obstinate pains of the loins and back. The one was a brazier, by name Peregrini. And this man (as I heard after coming here to take upon me the professorship) had still continu'd to be afflicted with his pains, till he, at length, died suddenly, which was an event but little expected by the physicians: so that my suspicion was confirm'd, of these violent pains having their origin from an aneurism of the aorta, where it descends in the course of the spine; and there is no doubt but his sudden death was from the rupture of the aneurism.

But the other was a nobleman, by name John Anthony Corbiceo, who was snatch'd away by a similar fate, when it happen'd unluckily that I was absent; otherwise I might have had the liberty of dissecting the body, which I should much have wish'd. For I suspected an aneurism in him, so as, at the same time, to fear lest a vomica might lie hid in the liver, of which, when ruptur'd, a speedy death would be the consequence. And, indeed, there were many marks, and those not obscure ones neither, of the liver being affected; but with these, nevertheless, were present, and even had preceded a great part of them, and perhaps all, such pains of the loins, as are not wont to be join'd with a vomica of the liver. It is, perhaps, worth while to relate the whole history to you here with accuracy, especially as I have promis'd it to you before (h).

(e) A. 1742. hebd. 20. n. 3.

(f) Paradigm. 13.

(g) Epist. 17. n. 3.

(h) Epist. 36. n. 6.

This gentleman was sixty years of age, tall in stature, of a large muscular body, his face being red from small subcutaneous veins, which were here and there conspicuous; but particularly at the lower part of the nose. The flux of blood from the hæmorrhoidal veins; which us'd to return at intervals, and without any injury to the constitution; having been diminish'd now for a twelvemonth, and uneasy affections of the mind coming on, his body began to be somewhat emaciated, before the beginning of the spring, in the year 1710. And soon after, as he was riding in his chariot, as his custom was then, a pain discover'd itself in each of his loins, and that part of the spine which lies betwixt them: in which parts it had been before obscure only, and not constantly, but sometimes. Now, however, it not only continu'd, but, being increas'd about the beginning of April, and grown much more severe before May, was very troublesome to the patient, especially when he was sitting, or lying down; and still more when he endeavour'd to turn himself in the slightest manner; or upon bending his body, and raising it again; or when he rose from his bed.

It was thought proper, on account of those things which I have said of the hæmorrhoidal flux, and, in like manner, on account of the blood, which, in the preceding months, had flow'd, more than once, spontaneously from the nostrils, that blood should be taken away, first from the arm, and after that from the piles; care being previously taken that the belly, which was then costive, should be relax'd. Opening the belly was of great use to the patient, as the first bleeding was also; so that the pain now seem'd to be quite remov'd. But the surgeon, nevertheless, having, without consulting any physician, applied leeches to the piles, which he found to be very turgid, so great a quantity of blood was suddenly discharg'd, that, not long after, there appear'd marks of the habit being much weaken'd and deprav'd. Being, therefore, sent for again, after the middle of June, I not only heard what I have already related to you, but other circumstances also. For it was now more than twenty days from the time that a jaundice had appear'd, with an œdematous swelling of the feet: at first he could get no sleep; his appetite for food was lost; and he had a languid sensation of the stomach after dinner: but now this sensation was quite remov'd, and his sleep and appetite also, though the latter in part only, had return'd since the time in which he first began to take the remedies that were given him against the jaundice: and among these remedies it had been observ'd that rhubarb, though very sparingly given with currants, had increas'd the lassitude; not so much because it purg'd much by stool, as because it exacerbated the pain in the last lumbar vertebra, and the basis of the neighbouring os sacrum. For the patient complain'd much of this pain being a great fatigue to him; and asserted, that it was much more troublesome, if he, at any time, walk'd through his chamber.

It chagrin'd me very much, that the pain, which had been suppos'd to be entirely remov'd, should have not only return'd, soon after it seem'd to have ceas'd; but should become more violent every day. Yet I was still more displeas'd with other symptoms. For I observ'd that the pulse of the patient was frequent, and somewhat hard; his respiration now and then deep, and difficult, as it were; his feet, and the lower parts of his legs, but parti-

cularly the foot and leg of the right side, were somewhat swell'd, and preserv'd the marks of pressure, after the finger was applied to them: his skin and his eyes were yellowish; his urine, and his eyes also, were observ'd to be more yellow in the day-time, and what was the worst of all, when I applied my hand to his belly, I found, on the right-side, under the very arch of the lower ribs, the liver swell'd to the size of a kid's head, and hard besides; but without pain. While I was feeling this tumour, the patient said that he had observ'd it for the space of three years, though not to be so large, as he had, also, some yellowness in his eyes; and yet, says he, you all very well know that I have always had good health till this year.

Having very cautiously determin'd, in conjunction with his physician, upon such remedies as seem'd most proper at that time, I went to see the patient again a third time, before the middle of July, in order to consult with the same physician, and with Albertini, who had been sent for from Bologna. At this time, however, the cedematous swelling of the lower limbs was entirely vanish'd, I suppose because the patient lay in bed for the most part: he had a good appetite for food, and his stomach seem'd to perform its office very well. But he was troubled with watchings in the night: his pulse was more frequent in the evening, though it was pretty much so in the morning; it was much larger than it had been before, and not without some impetus: he had a thirst: his tongue was very dry, and ting'd with a red colour, inclining to blackness: the skin was not yet without yellowness, although the stools were not, nor had before been, of a white colour: his urine was even then of a saturated colour, but thin: the tumour of the liver, in which there had been pain, sometimes, since my having seen the patient, though it had been readily appeas'd, might at that time be felt without pain, unless any one handled it for a long time, and somewhat roughly; for then some pain arose in the lower edge of the liver.

Albertini, while he was examining this tumour with his hand, thought he could observe some inequality, just as if the surface of that viscus was made rough, with a kind of pretty large granules; and from hence he conjectur'd that the tumour was inclin'd to a scirrhus nature, in consequence of the glandular bodies, as it were, of the liver being distended by the concremented bile: yet, by reason of the pain, he was afraid lest the nature of the tumour should be different in some other part. When he had, in conjunction with us, approv'd of such things as it became a very cautious physician to approve of, and had return'd to Bologna; and I was gone to a distant place to attend the cure of a patient there; it suddenly happen'd that this patient; who had not only seem'd to be no worse in those days, but on the fourth from our consulting together, seem'd to those about him, and in particular to himself, to be much better; having got up to take his supper, at the first hour of the night, was seiz'd with a kind of troublesome sensation of his stomach, and of the affected part; his face being, at the same time, cover'd all over with a cold sweat, his lower limbs very cold, and his belly very tumid.

He was already laid in bed again, when the physician, who had been sent for in haste on this occasion, found, beside the other circumstances, a pain of the whole epigastrium, a reaching to vomit, a low and languid pulse; his voice and his senses being weak, and his face like that of a carcase. There-

fore, at the eighth hour from the beginning of these symptoms, death came on. Must we suppose this to have happen'd from an abscess of the liver being ruptur'd, as most of the symptoms, but not all of them, seem to shew? Or must we suppose it to have been owing to the rupture of a sanguiferous vessel?

Albertini himself; who had lately observ'd all the circumstances which fell under his examination, with great accuracy, according to his custom, and had enquir'd into the others, and did not know of any more besides those which I wrote to you of just now; having receiv'd an account, in a letter from me, of the death of this man; though he naturally conjectur'd that something had been ruptur'd, by the motion of the patient in rising, and that a great quantity of fluid was extravasated into the cavity of the belly; yet he declar'd that he could not so well conjecture what it was that had been ruptur'd. But if some marks of a suppurated tumour, and among these, what he chiefly requir'd, rigors, and shiverings, had preceded; none of which certainly had ever happen'd; he then confess'd, that he should, without hesitation, have accounted for the circumstance from a ruptur'd vomica of the liver. Therefore, if, in any part of the liver, any tumour had happen'd to come slowly and latently to suppuration, that he suspected the sudden death was not so much to be imputed to the rupture of that small part, as to the rupture of some contiguous blood-vessel, which had been injur'd by the pus. Yet by this suspicion, that old and obstinate pain in the vertebræ was not explain'd, mention of which I do not remember to have seen made, in the great number of histories of abscesses of the liver, that I have consider'd; and besides, that tumour, which we had touch'd, with our hands, was far distant from the vertebræ: and the lower edge of the liver, where I have said the pain had been for the most part, of late, was still more so.

Nor is there any colour for our supposing the pain, which was extended to the lower vertebræ, in particular, and the basis of the os sacrum, to have been owing to the trunk of the hæmorrhoidal vein; the roots of which we have said were so turgid; for after that great quantity of blood being discharg'd thereby, they were certainly no longer turgid: and when they were the most turgid, it had, even then, happen'd that the pain seem'd to have been remov'd, though for a short time. But if an aneurism of the aorta, where it goes down upon the vertebræ; of which I have some suspicion, besides the tumour of the liver; does not seem to you to be such a disease, that the effects of it could be so far obscur'd, even for a short time; and that cannot be conceiv'd to exist without many other, and considerable symptoms; I beg of you to determine nothing on the question, before you have read the observation which is here subjoin'd.

29. An old man, who was formerly suppos'd to have been disorder'd from the lues venerea, had already lain many days in this hospital, complaining of every thing, but what could refer to that lues, or to a large internal aneurism; and certainly, for I enquir'd with the greatest care, was neither troubled with pain, nor a sense of weight, nor a difficulty of breathing. He died a little after dinner, and that suddenly, about the middle of December in the year 1718.

The belly being open'd, and the urinary bladder taken away, together with the penis; for I was at that time busy in observing some things that re-
late

late to those parts; the urethra confirm'd the opinion of that old lues. For it was, in several places, full of scars, and the feminal caruncle itself was not in its natural state of conformation; so that it was not easy to demonstrate the two very small orifices, into which it is perforated laterally, nor the orifice of the sinus, which lies betwixt them. To these were added fibres, distinct from each other, and prominent; from which something like a small triangle was form'd, the basis whereof was very near to the bladder, while the vertex touch'd the caruncle.

The viscera being then remov'd, a large aneurism of the great artery came into view; resembling a crescent in its figure, the back of which was plac'd transversely under the annex'd diaphragm, while the horns were turn'd downwards, and were hid behind the psoæ muscles on each side; the left horn so far as to reach to the lower third part of the muscle; but the right did not come down so far. This aneurism, likewise, had no posterior paries; wherefore, taking away the blood with which it was fill'd; and which had been, in great measure, form'd into polypous laminæ, lying one upon another; the bodies of two or three vertebræ, that belong'd to the lower part of the thorax, and the upper part of the loins, immediately appear'd: these vertebræ were naked, but deeply eroded; the white and cartilaginous ligaments being here, also, protuberant betwixt body and body, and, to appearance, untouch'd by disease. But this aneurism had been ruptur'd, in its upper part, on the left side; so that the blood, where the diaphragm had given way, burst forth, from the same side, into the cavity of the thorax, which it had almost universally fill'd.

30. You see, then, how obscure the signs of so large an aneurism were in this case; though it is not to be doubted but some must formerly have preceded, and particularly pains of the loins.

But if you compare this observation, and that made upon the carman (*i*), with other observations of aneurisms in the aorta, whereby the neighbouring vertebræ were corroded; you will, perhaps, be surpriz'd at one thing, I mean, that the ligaments lying betwixt these vertebræ had appear'd to us to be untouch'd: which other writers of these observations, as far as I can at present remember, have not taken notice of. And indeed some of them have expressly said that those ligaments were found to be hollow'd out, and consum'd, no less than the bodies of the vertebræ; as, for instance, the celebrated Vernojus (*k*), and the author of the last figure but one, in the memoirs of the Royal Academy of Sciences at Paris, for the year 1714, whereby this is clearly shown.

And indeed that cartilages are then liable to consumption; whether this happens from the frequently repeated strokes of the blood, rushing into the aneurism, or from the eroding particles, as I have already explain'd (*l*); is shown by the observation of the celebrated Maloet, given us in the same memoirs, for the year 1733; wherein some cartilaginous segments of the aspera arteria, which serv'd in the stead of a posterior paries to the aneurism, were found to be become already very weak, and less convex than natural; and two of them, in some measure, consum'd. And as I have spoken to you of this

(*i*) Supra, n. 26. (*k*) Comment. Acad. Sc. Imp. Petropolit. tom. 6. (*l*) Epist. 18. n. 27. obser-

observation before (*m*); I also there said, at the same time, that the softer parts were less worn down than the more firm and solid, as they gave less resistance to the stroke; but here I do not see that the same explication can be admitted of.

For if I say that the ligaments, which lie betwixt the vertebræ, give less resistance than the vertebræ, and for that reason suffer less attrition also; you will immediately ask, why then were they not found in the same state in others, as they were in those two men whom I describ'd; but in the one consum'd, in the other untouch'd? If these, in whom they were untouch'd, had been both of them young men, and the other old, it might perhaps have been answer'd, that in the former these ligaments gave less resistance, and in the latter more. But not to insist upon the other examples; as I certainly may upon that given by Vernojus, which is from a young man; even the first of mine is from a young man: so that it does not appear why they should be destroy'd in the former, and not in the latter; nor yet why they should not be destroy'd in the old man whose history I have given. The obscure cause, therefore, of this difference; whether to be accounted for from the different nature of the eroding humour, in different bodies, or from any other cause; I leave for you to investigate: for this letter is already sufficiently long. Some days hence I shall send you another; but in the meantime I wish you much health.

(*m*) Epist. 21. n. 48.

LETTER the FORTY-FIRST

Treats of the Suppression of Urine.

ALTHOUGH the total defect of a urinary discharge happens either from a disorder of the kidneys and ureters, or of the bladder itself, and urethra; yet it has never happen'd either to Valsalva, or to me, to dissect the bodies of those who died from the former cause only. Nor is it to be wonder'd at, since the kidneys and ureters are double; so that if their office should happen to be suspended in one side, the defect is supplied by the other. For what is believed by many is not always true, that when either of the kidneys is inactive, the other is inactive, also, at the same time: which opi-

nion is rejected in the foregoing letter (*a*): and you will even find such a number of observations, in the twenty-fourth section of the Sepulchretum (*b*) (whereto this letter relates) which may be added to the observations I have pointed out in the preceding; that, if you compare them with those of the urine being suppress'd from a disorder of one side only, you will be very clearly convinc'd that these latter observations are much more rare than the former.

For those of the first kind will be met with in several places; not to mention where Gerard Blasius (*c*), Isbrandus Diemerbroeck (*d*), Ludovicus Mercatus (*e*), insist upon this kind as being the most frequent: and if you would choose to add those which have since come out, in the volumes of the Cæsarean Academy (*f*), you would certainly find none which did not relate to the same kind; that is to say, both the kidneys being either seiz'd with a sphacelus, or, even, as Rudolphus Jacobus Camerarius saw (*g*), being affected with an unusual loss of tone, and flaccidity, or stuff'd up with calculi: or if one of them did not labour under the same disorder, at least consum'd, and inactive; or its ureter obstructed with sand and calculi.

But the observations of the other kind, that is of the urine being suppress'd on account of the disorder of one side only, in the cited section of the Sepulchretum, amount but to few; and so much the fewer, because one of them, as that which is read under the nineteenth article of the first observation, does not belong to this class, as it, at first sight, seems to do: and this we may clearly gather from the same history, when more fully given, not only in the twenty-second section, under article the first of the thirteenth observation, but even in this very section, under the fourth article of the first observation; so that there was no occasion to repeat mutilated observations in particular, not to say, to repeat them a third, and even a fourth time: for what we have under the twentieth and twenty-second articles, of the same first observation, although they may seem to be different, by reason of the name, and number of days, being chang'd through neglect; yet that it is the very same, appears from inspecting the third section of the first book, under article the first of the fifteenth observation; and in like manner under article the first of the thirteenth observation, of the twenty-second section which I just now quoted, of the third book. And I could wish this history was the only one that is repeated in that twenty-fourth section, of which I have begun to speak.

But you, by comparing article the eleventh of the second observation, with article the ninth of the fourth; and, in like manner, the eighth observation with article the fourth of the tenth (*b*); and article the seventh of this last, with the eleventh observation; and to return to the first, and second observation, by comparing article the second of the former, with article the twenty-first; or article the third, which is improperly mark'd the first, with

(*a*) N. 15.

(*b*) L. 3.

(*c*) Obf. 1. §. 9.

(*d*) Ibid. §. 10.

(*e*) Obf. 2. §. 1.

(*f*) Dec. 3. a. 4. obf. 60; a. 7 & 8. obf. 147;

a. 9. & 10. obf. 95; & cent. 5. obf. 22. cent. 6.

obf. 55. & 56; & act. tom. 2. append. n. 3. & tom. 3. in obf. 6.

(*g*) Specim. experim. circa generat. part. therap. in resolut. hist. 3.

(*b*) Primam de duabus intellege eodem n. x. designatis.

article the twenty-seventh; and, in like manner, with article the second of the second observation; you will immediately perceive how much better it would have been to have given them only once⁽ⁱ⁾; or, if the authors themselves had written their own observations more than once, and, for that reason, not always in the same words, to have added the second manner of writing it immediately under the other, if it seem'd a thing of importance to do it.

There are, however, in this section some histories of the second class also, as under observation the first, article the fourteenth, and under observation the third, article the first, second and third; and if you please, moreover, under observation the fourth, article the second. But what are these to the far greater number of the first kind? Which is increas'd by some others, that you meet with in the additamenta to the twenty fourth section: for the observations, given in this section, ought to have been added, in the greater part of them, to the preceding section, and besides this, others are omitted, even those that are most obvious; as, for instance, that which had been given us in the *Centuria of Ruysch* (*i*). It is certain therefore, it happens much more rarely that a suppression of urine is brought on by a disorder of the kidneys and ureters, which are double, than by a disorder of the bladder and urethra, which are unduplicated parts: and for this reason it is the less a matter of surprize, that I have not yet had it in my power to dissect the bodies of those who have perish'd from an obstruction of these first-mention'd parts.

2. And I have been still the more desirous of dissections of this kind, that I might have an opportunity to examine those parts, in these bodies, from whence, through which, and to which, different authors take notice of different peculiar passages of the urine. For although I have propos'd an argument against these passages, in the *adversaria* (*k*), taken from those circumstances which, it is very certain, have been observ'd in suppressions of urine happening from a disorder of the kidneys; which argument has seem'd to me of so much the more weight, since I have observ'd, that it was very pleasing, not only to others, afterwards, but even to Boerhaave (*l*) himself: yet I with'd more fully to satisfy a certain celebrated man, who thought that these peculiar passages terminated in the *pelves* of the kidneys, and that neighbourhood, as many believ'd even before: so that, although the kidneys only are seen to be obstructed by calculi, or any other impediment of this kind, yet, for that very reason, the mouths of these passages may, at the same time, be compress'd, and transmit nothing, at that time into the *pelves*, or the neighbouring ureters.

You therefore, when you shall be furnish'd with an opportunity of dissecting bodies of this kind, will, I hope, do what I intended to have done; that is to examine, with the greatest accuracy, all the membranes which are bordering upon, or connected to, those parts; for if the mouths of these passages are compress'd, it cannot be but the remaining tract of them must be so much the more distended with the stagnating fluid, in proportion as the orifices, which emit this fluid, are more shut up; especially as the offices which they ascribe to these parts require, and even they themselves readily allow, these passages not to be very small: although it seems, from one cir-

(i) Obs. 15.

(k) III. Animad. 36.

(l) *Prælect. ad Instit.* §. 385.

cumstance, as if your labour would be in vain; I mean from this, that we never read of these passages having appear'd to any one in cases of this kind, notwithstanding a great number of bodies had been taken in by such persons, which must, of course, have distended these, or any other passages, that have been suppos'd, by others, to lead to the bladder; and notwithstanding very accurate and experienc'd dissecters examin'd the bodies after death.

For Franciscus Plazzonus; to use the example of that history which I have shown to be three times repeated, in this section of the Sepulchretum (*m*); either dissected himself, or was present at the dissection of, that monk, to whom, among other diuretics, even cantharides had been given; which had ulcerated the bladder, although empty: so as to convince us that the virtue thereof had reach'd thither by means of the sanguiferous vessels, and not by any peculiar unknown passages; which, together with this virtue, would have transmitted the diuretic potions, at the same time, either into the *pelvis* of the kidneys, or ureters, or immediately from the stomach into the bladder. For this second opinion was embrac'd by many, either, perhaps, on account of these words of Hippocrates (*n*); or at least, of a very ancient author; "if a child shall have veins going from the stomach to the bladder which are large, and have a power of attraction," or rather on account of these things which they had heard of, as happening in a true diabetes, very extraordinary examples of which you may read in Marcellus Donatus (*o*); I mean "that what is drunk should be discharg'd by the urinary passages, without the least change whatever, preserving the same colour, consistence, taste and smell," as when taken in.

But if it is necessary, for that reason, to suppose ducts going from the stomach to the bladder; it would be necessary to suppose others going to the skin, as to these examples, Donatus has made no scruple to subjoin this, also, of a very handsome girl, who had been for a long time afflicted with fevers, in whom "the fluids, that she drank down, were discharg'd from the precordia by sweat, before the cup was well taken from her mouth; and that in the same quantity in which they had been taken in, and without any alteration; so that from red wine, the linen, with which she was cover'd, was ting'd with a red colour;" and "from white broth, in like manner, with a white colour;" and that this had been observ'd "for the space of two weeks." Yet in regard to these unknown ducts; by what way soever they may be suppos'd to pass from the stomach to the bladder, or urinary passages; I remember that the celebrated Fastrucius very justly observ'd to me, formerly, in a letter, that if there really were such passages, it must, of course, have happen'd to those who abuse quicksilver, in our country as well as others, so as to take near an ounce every morning, that some part of it, at least, would have been discharg'd with the urine; which, however, had by no means been observ'd, by our physicians, in any one of these persons.

But if you should say, that these ducts are scarcely open in a natural state; though they are dilated in fevers, from which the chief of those examples of Donatus are taken; you would neither answer the objection of Fastrucius, nor obviate the other phænomena, on account of which these ducts have been suppos'd to exist: and, certainly, in the first of Donatus, from Trin-

(*m*) Supra n. 1.(*n*) De Morbis. 1. 4. n. 28.(*o*) De Med. Hist. Mirab. 1. 4. c. 27.

cavellius, the liquor that was drunk ought rather to have constring'd the orifices of those ducts, as the patient refus'd to drink any thing "that was not almost cold."

But what shall we say, you will ask, to a more late observation (*p*)? I mean of that virgin who had an ascites, and in whom "the left kidney, as well as the right was universally scirrhus, and indurated; and had coalesc'd in such a manner, that even no pelvis could be discover'd;" notwithstanding this patient had discharg'd urine, though indeed "in a very small quantity, and limpid like fountain-water," instead of being "red, and thick," as in the beginning: but still, however, she had discharg'd urine.

Was it because a little quantity of the fluid stagnating in the belly, had pass'd "through the pores of the bladder, which went from without inwards?" Or, rather, because some small part of one, or other, of the kidneys, had not been as yet, entirely indurated, and constricted, when she last made water, as it appear'd to be after death; for which reason urine had still been secreted through the narrow passages, as the unusual limpidity of it seems to demonstrate?

Certainly, it did not pass through ducts opening into the ureters, or bladder; inasmuch as they would have brought a much greater quantity of fluid, from the stomach.

3. But be this as it will; I shall here give you what Valsalva and I have seen in the dead bodies of those, who, while living, had labour'd under a suppression of urine, from a disorder of the bladder or urethra; yet what I shall now give you is not the whole. For you have had in the last letter (*q*), and, in like manner, in the twenty-fourth (*r*), some of the appearances which he had observ'd; and some of those that I have observ'd, in the fourth letter (*s*), and tenth (*t*): and in others you will have other remarks. What I suppos'd, then, to relate principally to this subject, among the papers of Valsalva, are the following.

4. A young husbandman; whose two brothers, and they young men also, had died of acute diseases, about the vernal equinox, in the preceding years; died in this manner, at the same time of year. Having repell'd a scabies by I know not what kind of ointment, his urine was soon after suppress'd, not without a vomiting, and pain, sometimes, in the loins on the left side. However, he did discharge urine after this several times; but in small quantity, like a saturated lixivium in colour, and with pain: it was in vain attempted to increase the discharge by introducing the catheter.

At length the whole body swell'd: and a large and laborious respiration coming on, he died on the day following; which was about the twenty-first day from the beginning of the suppression.

The bladder and the kidneys were found; except that these last-mention'd parts were somewhat larger than their natural size: and the bladder contain'd about two pints of urine, such as I have said was discharg'd. And in the cavity

(*p*) *Commerc. Litter. a. 1743. Hebd. 25. n.*

2. ad 3.

(*q*) N. 4.

(*r*) N. 7.

(*s*) N. 19.

(*t*) N. 13.

of the belly was a stagnating fluid, that smelt like urine, though similar to limpid water. This fluid, being preserv'd in a glass vessel, separated into many broken parts, like what are generally contain'd in urine.

But when put upon the fire, it at first became turbid, and similar to the whey of cow's milk, and soon after like milk itself; and, finally, concreted to such a degree, as perfectly to resemble the white of an egg: a concretion of which kind had been never before seen by Valsalva, in any morbid humour of the body.

In the thorax, the lungs were much distended with air, and connected to the pleura at the back; they were found nevertheless. The right ventricle of the heart contain'd a polypous concretion of a moderate size, the left contain'd one of very small dimensions.

5. What violent disorders have been brought on, by the repulsion of the acrid particles of a scabies, into the blood, has been already shown by me (*u*), in the cases of two women. But in those patients, these repell'd particles fell on different parts: in this young man they mix'd with the urine, and fell upon the kidneys and bladder: and by pricking and vellicating the internal membranes of these viscera, occasion'd a pain in both of them; by which these thin membranes were crisp'd up, and a resistance, for that reason, almost constantly made to the efflux of urine: from whence the kidneys became larger, by this fluid being confin'd internally; and the bladder; either because it frequently contain'd scarcely any urine, or because it could not contract itself properly, or rather, because it did not admit the catheter, when this was introduc'd, into the urethra; discharg'd nothing: and when the catheter was withdrawn, it discharg'd nothing, but seldom, and that with pain.

The matter of urine, then, being detain'd in great measure, in the sanguiferous vessels, was; at length, the cause of death: although it overflow'd into other parts, and particularly into the cavity of the belly; as was prov'd by the odour of the fluid which stagnated there. For this excrementitious fluid readily mixes itself with the humours, that are then secreted from the blood.

Therefore; to produce an example which has not, for I know not what reason, been added to the *Sepulchretum*; Malpighi (*x*), in his preceptor *Natali*; whose ureter and kidney he found to be surprizingly dilated, from the urine being intercepted by an obstructed calculus, the suppression, which in the end prov'd mortal, lasting for many days; observ'd that his saliva carried in it the taste and smell of urine, and that the halitus, transpir'd through his skin, had been of the same urinous kind.

And Albertini related to me, that the noble youth; the structure of whose kidneys we see describ'd by Malpighi, in the letter to Sponius; had not only spat up a saliva, in the same disease, which had the taste and smell of urine, but even almost urine itself instead of saliva; as the colour, added to the smell and taste also, testified; the matter of the urine flowing to the salivary glands in such a quantity, that the cheeks and the parotid glands were tumid.

(*u*) *Epist.* 16. n. 34. & *Ep.* 38. n. 22.

(*x*) *Op. Posth.*

By reason of this discharge, perhaps, it was that he liv'd so long; till, the suppression being overcome, he made a great quantity of water: although it, nevertheless, happen'd to him, as it has frequently happen'd to others, when they have at length discharg'd urine, after a very long retention; I mean that the humours, and the viscera, being injur'd, and deprav'd, he died not long after.

Thomas Bartholin (*y*); when he mentions other excretions, by means of which patients who have the urine suppress'd, drag on, or preserve life for a long time; omits that of the saliva which I have taken notice of, and enumerates stools, vomitings, and sweats. He produces an example of stools in his colleague (*z*). And instances of vomitings, and sweats, though he has not expressly produc'd any, it is easy to supply from the observations of others.

Thus our Vallisneri (*a*) saw vomiting of serum come on, after the tenth day of the suppression; which serum resembled urine in its colour, taste and odour: and the virgin, who was the subject of this disorder, liv'd till, many remedies having been made use of to no purpose, both internally and externally, he at length open'd the passages of the kidneys by giving mercury internally, and applying it outwardly.

Thus a physician of Mantua (*b*) saw another virgin troubled with the same disease, and a vomiting, at first, more than forty days; and, not long after, at least for two and thirty days. Thus another (*c*) saw a third labour under this suppression, and vomiting, for fifteen months; so that she could scarcely be supported by any other means, than that of nourishing glysters: till the calculus being discharg'd, the ichuria, and the vomiting of urine, went off.

But where the calculi, which obstruct the kidneys, and the ureters, cannot be remov'd; in vain, as Gulielmus (*d*) has observ'd in two cases, do vomitings of urine come on: and this is to be understood both of other insuperable causes of disease, and of other discharges: in a woman, therefore (*e*), who already perceiv'd the taste and smell of urine in her mouth, the vomiting of blood itself, and the discharge thereof by the nostrils, if it was at all of use, was so far of use, that she drag'd on life quite to the thirtieth day of the disease.

To return, however, to the excretions spoken of by Bartholin; he has particularly pointed out the observation of Carolus Piso (*f*), as worthy of remark, in relation to sweats; for they were constant, copious, of long continuance, and so foetid that the smell of them could hardly be endur'd: a discharge by the urinary passages, therefore, coming on again, the patient was freed from his disease. Not thus fortunately did it happen to the virgin of whom Petrus Nannius has given the history.

In her the urine had also been long suppress'd by reason of calculi, so that he now thought her quite lost; when a sweat burst forth in an immense quan-

(*y*) Cent. 4. Epist. Med. 18.

(*z*) Ibid. & Epist. 21.

(*a*) Eph. n. c. cent. 9. obs. 50.

(*b*) Hist. de l'Acad. R. des Sc. A. 1715. obs. Anat. 3.

(*c*) Aët. n. c. tom. 3. obs. 6.

(*d*) Exerc. de Sang. Nat. n. 68.

(*e*) Eph. n. c. cent. 6. obs. 56.

(*f*) De Morb. ab Aqua S. 4. c. 6. obs. 127.

tity, that had a urinous odour. As long as this sweat lasted, and it lasted many days, the virgin was much better. But when this ceas'd, she was carried off within a few days, by a dropfy of the thorax.

But more happy, for a time, than this was another virgin of Padua formerly, of whom Marcellus Donatus (*g*) gives the history, from a physician of undoubted credit. In her, not from the whole body, but only "from the region of the stomach, a humour was transpir'd to the weight of many pounds, resembling urine both in colour and smell;" whereas not only the natural discharges of the kidneys were suppress'd, but the natural discharges of the intestines also. And these discharges were suppos'd to have supplied the defect of urine (which for six months before had been wholly suppress'd) that is to say, in consequence of the intestines being then "relax'd."

And even insensible perspiration seems to have supplied this defect, in a young woman, who; which is a very extraordinary instance, though well-known at Verona; had not excreted a drop of urine for two and twenty months, when the celebrated Zeviani (*b*) mention'd it. For in the bed-chamber of this woman an odour of urine was perceiv'd, which the bed-clothes also seem'd to exhale. In the mean while she was afflicted with many diseases though with none of the brain. But that virgin of Padua at length fell into a marasmus.

These observations I have quoted, although they in general relate to those persons, in whom the urine is retain'd, by the disorder of the kidneys; which cause had also partly existed in that man whom I have spoken of from Valsalva: nevertheless they sufficiently show from whence they also perish, in whom it is long retain'd, only from a disorder of the bladder, or urethra; and yet there is not that inflammation of the bladder at the same time, to which, or the subsequent gangrene, we may ascribe the death of the patient. To that kind I should suppose this second observation of Valsalva to belong.

6. A man, of seventy years of age, having labour'd under a long difficulty of making water; so that he discharg'd no urine but by the help of the catheter; finding his disorder increase every day, was oblig'd to come into the hospital of St. Mary de Vita at Bologna. There, while the lithotomist was endeavouring to procure an exit for the urine, by means of the catheter, without effect, he died with a laborious respiration and a stertor.

The fibres of the urinary bladder had so increas'd, as to resemble the strong bundles of fibres in the heart; and that both in figure and magnitude. An excrescence of the prostate gland, in the form of a pear, and scarcely leaving any passage, had been affected with an inflammation in the lower part; from the continual impetus of the catheter.

The right ventricle of the heart show'd the beginning of a polypous concretion.

7. It is evident that an inflammation, of that kind, could not be the cause of death in this man. However, to what a pitch the blood might be, by degrees, deprav'd, in a body thus weaken'd by old age, and by a very frequent retention of urine, so as to be confin'd to bed, it is not difficult to conjecture.

(*g*) C. 27. cit. supra ad n. 2.

(*b*) Del flato, l. 2. c. 11.

It is not surprizing therefore, that a retention coming on, which could not be remov'd by the catheter, such symptoms should begin during the time of the fruitless irritations from that instrument, as at length carried off the patient in a short time.

Even without these irritations, he would have died nevertheless: but perhaps a little later, as so many others have done; and among these a man, also, whose history I shall add at present, just as I receiv'd it from the same physician, whom I have commended to you on a former occasion (*i*), I mean Marifati.

8. A man, who lay in this hospital for a suppression of urine, had already had it drawn off twice, by means of the catheter, and always in great quantity. As either the patient, or others, fear'd lest the neck of the bladder should be too much irritated by this introduction, and, for that reason, abstain'd from it, death came on not without convulsive symptoms.

When the body was open'd, all the viscera, and even the bladder itself, were found to be, as far as we could judge by the senses, perfectly sound; for the bladder was only distended, without any beginning of inflammation, so as readily to contain such a quantity of urine, as three glass vessels, of the size with those that we use to receive blood from a vein when open'd, or even to receive urine in this country, would scarcely have contained.

9. To what a degree I have, more than once, found the bladder distended, and yet not inflam'd, not only observations already written to you (*k*) demonstrate, but will also be shown by one, in particular, which I shall give you when I treat on the subject of lameness (*l*). Now that you may conceive how much the bladder may sometimes be extended without any ill consequence, I will subjoin what happen'd here to a woman of character, whom I very well know, and who is now in very good health.

She was in labour of her first child, and more than two and forty years of age. As the bones of the pelvis did not, for this reason, at all give way, and the lower part of that cavity was narrow, the large head of the child stuck there; and the urethra, and the nearest part of the bladder, being compress'd thereby, the urine was absolutely confin'd. The short kind of catheter, which is made use of for women, was at length introduc'd after great difficulty, but to no purpose.

There was a necessity, then, of introducing one of the longest which are us'd for men; but less curv'd than in general: and now it had enter'd to the length of a span, yet no urine came forth. It was necessary therefore, to thrust the catheter up higher, in order to discharge that fluid; and by this means the urine came forth to the quantity of about four pints.

She was a very small woman: from whence you will better perceive how much (which was also shown by the very high and peculiar swelling of her abdomen) how much, I say, the bladder must have extended itself; and even the superior part of the bladder, since the inferior part was so compress'd as I have said, as to be prevented from extension. However, the child, which was not only dead, but had even a very putrid smell, being soon after taken away, no injury or danger from the bladder remain'd.

(*i*) Epist. 27. n. 4.

(*l*) Epist. 56. n. 12.

(*k*) Epist. 4. n. 19, & Ep. 39. n. 33.

But if you inquire after examples of this cavity being greatly distended, and attend to the event which the greater part of them have had; to set aside rupture, which has been found from the distention, even in the bladder of an ox (*m*); you will certainly find, that, according to the different disposition, and nature, either of the parts, or of the blood, or of the urine itself, it has happen'd far otherwise to many, than it did to the woman in question.

It is generally known that the bladder, when distended to a very great degree, has frequently lost the power of contracting itself; and this, as you will gather from the observation of Mauchartus (*n*), may sometimes happen in a short time: for this author, after an ischuria of the bladder, which had begun four days before; although after the two first days he had taken care that the water should be drawn off more than once, and found the bladder to be quite empty in the body after death; nevertheless observ'd that reservoir to be "very large, and not contracted as it generally is."

Nor is it less commonly known, that the bladder is easily affected with inflammation; the beginnings of which only existed even in this body: so that the inflammation itself in many others is found to be much more considerable. What is the very natural consequence of this inflammation, you will learn from the authors who are quoted, as witnesses of a very great distention, by Henricus Meibomius (*o*); who, nevertheless, I know not how, produces one observation of Hildanus as two.

For Hildanus has describ'd the same observation, which he has mention'd, in a slight manner, in the fifth chapter of the book *De Lithotomia*, more at large in the second *Centuria*, observation sixty-five; and tells us there that he had found in the body of an old man after death an ulcer of the bladder which penetrated quite to the intestinum rectum. But that is a much more frequent consequence of inflammation, which you will find to have been three times observ'd by another of the authors quoted by Meibomius, I mean Panarolus (*p*); that is to say a gangrene degenerating into a mortal sphacelus.

I never remember to have seen a more considerable gangrene, after an inflammation which had seiz'd upon the bladder, when it had been, for a long time, distended, than in the body of a rustic which some unexperienc'd young men had improperly taken care should be carried into the anatomical theatre at Bologna, in the year 1706, without any previous examination.

10. This man, as was found out afterwards, having been subject to disorders of the kidneys, bladder, and intestinum ileum, had now been, for some days, incapable of discharging his urine. Wherefore, his belly being become tumid and black, he died.

The lower parts of the belly, particularly the viscera, and among these the bladder, were of a blackish colour; as the scrotum was also: and in this was an intercepted portion of the intestine I have mention'd; the blackness extending itself not only into all the neighbouring parts, but even half way down the thighs: so that we were obliged to send almost the whole body away, very soon, lest the violent putridness of the smell should infect the

(*m*) Act. n. c. tom. 8. in obs. 2.

(*n*) Eph. n. c. cent. 9. obs. 41.

(*o*) Exercit. de Catheterismo thes. 17.

(*p*) Jatrologisim. Pentec. 1. obs. 27.

whole college. I did just take notice of some things in the kidneys, in a cursory manner, which, as I have deliver'd them in another place (q) I shall not repeat at present.

II. Whether the interception of the ileum preceded the suppression of urine, or this preceded the interception of the ileum, I could not learn for a certainty. This however I know, which I have also asserted in a former letter (r), that to an inflammation of the ileum was join'd a suppression of urine.

But there are also many other causes, situated on the outside of the bladder, which obstruct the urine therein. I have just now (s) spoken of the foetus pressing upon the cervix of this reservoir, in a difficult birth: and even in utero-gestation, particularly in the latter part of the time, there are women, some of whom I have very well known, who cannot make water, but in a supine posture.

Add to these things: to pass over those which happen very rarely; for we know that a glandular body has been found growing to the female urethra, externally, "of more than the size of a man's fist (t);" we know that very acrid medicines applied to the pudendum, in order to constrict it more closely, the first by pressing upon the urethra, the latter by exciting a very violent inflammation, have brought on a mortal suppression of urine; which we are not ignorant has even been caus'd by the blood distilling, by degrees, from a vessel of the wounded omentum, coagulating in the pelvis, and greatly compressing the neck of the bladder (u): add to these, I say, a great quantity of very hard excrements, or very tumid hæmorrhoids, which may press the neck of the bladder against the bones of the pubes, in such a manner, as to prevent any of the urine being discharg'd.

To this case of the piles, relates what Giovanni Amatorio, a very old and successful surgeon, in the place of my nativity, asserted to me, when I was a young man; I mean, that when the fibres about the lower part of the bladder are turgid with stagnating blood, or humour, it is of very great advantage to apply leaches to the hæmorrhoidal veins.

Thus in the grandfather, who was even then alive, of Peter Scanelli; a gentleman of rank, and one with whom, by reason of his fondness for polite learning, I was very familiar; when Amatorio himself had been oblig'd to draw off the urine, by the introduction of a catheter, ninety times, he affirm'd that this very obstinate suppression had been at length remov'd by that remedy, after many other remedies had been administer'd in vain.

And as to hard excrements, the observation of Wepfer (x) is very well known: to which; as it is also transfer'd into this section of the Sepulchretum (y), but not without such typographical errors as render it quite unintelligible; you may add another that you read in the Additamenta to the next section, that is the twenty-fifth (z).

(q) Epist. 38. n. 41.

(r) Epist. 34. n. 8.

(s) N. 9.

(t) Act. n. c. tom. 1. obs. 201.

(u) Vid. Hoffm. Med. Rat. tom. 4. p. 2. f.

2. c. 7. in ipso fine.

(x) Auctar. Hist. Apoplex. 13. Schol. 8.

(y) In append. 1. ad obs. 19.

(z) Obs. 5.

The same happy success which the first relates from the injection of a glyster, not only many have experienc'd in other places, but was in particular experienc'd here by a Jew, to whom no other remedies had been of service. It is then, however, sufficient to inject such things as are emollient; especially if there be the least danger of an inflammation of the bladder, or a suspicion of any convulsive stricture of the sphincter thereof.

Neither of these circumstances, a senior physician, who related to me two or three of his successful cures, seem'd, to me, to attend to sufficiently; for by giving such things as purg'd the intestines pretty briskly, he said he had caus'd the suppress'd urine to be discharg'd, at the same time with the stools.

By this means, said he, if I had not caus'd any real discharge of urine, yet at least the more fluid I had drawn out from the intestinal passage, so much less would, of course, have flow'd down by the kidneys, in order to distend the bladder more and more: and the fluid, with which the bladder was distended, was excited at the same time; as by stimulating the intestinum rectum, I could not avoid stimulating the fibres of the neighbouring bladder to contraction in like manner; and in great measure restoring to them their lost power.

But he did not sufficiently observe, that no part of the bladder was more closely join'd with the intestinum rectum, than the lower part; or if you please the beginning of the urethra: nor did it occur to him what must therefore be the consequence, if this part should be, at that time, affected with any beginning of inflammation, or convulsion.

It is true, I do not disallow that the bladder, at one time, loses its power of contraction from a paralysis; and, at other times, from the distention itself. But I say this, that the causes of a suppression of urine in the bladder ought to be very carefully distinguish'd: nor are we to imagine that the power of contraction, inherent in the muscles of the bladder, is always so easily and so soon taken away by distention; as we have gather'd above (*a*) from the example of Mauchartus.

This is demonstrated; to take no notice of other things; by the dog which Boerhaave dissected (*b*): for in this animal; although the bladder was extremely full of urine, that had been retain'd already, for the space of three days; when the bladder was punctur'd with a slight wound, "the urine nevertheless sprang forth to a great height: and the bladder contracted itself "to such a degree, that scarcely any cavity remain'd.

12. There are also many other causes, which, as they have it in their power to retain the urine in the bladder, so they also forbid the use of those stimuli, whereof I have spoken; as, for instance, that which I know to be in the place of a domestic remedy with some: I mean the application of a tile, or brick, which has been previously immers'd in cold water, to the soles of the feet of a person who has a retention of urine: and this remedy a physician, that was a friend of mine, imitated with a happy boldness, when he was a young man, by applying ice itself to the feet for a little time.

(*a*) N. 9.

(*b*) Prælect. ad Instit. §. 366.

For, although these things may possibly excite the stupified power of the bladder, by stimulating the extremities of the crural nerves; you, without doubt, are aware how noxious these irritations may be, where the retention of the urine has begun from the acrimony thereof: or where; according to the conjectures of the very diligent Pujati (*c*), and the observations of the very experienc'd Benevoli (*d*); the bladder is depriv'd of that mucus, wherewith it is smear'd over to defend it against the too great stimula of the urine.

I say nothing of the bladder itself falling down into the scrotum, although I have learn'd, from the time that my friend Georgio Georgi; a physician of great eminence, at present, among the inhabitants of Pefaro; wrote to me, that this is not so rare as was suppos'd by Mery (*e*); who, when he describes it as having been seen twice by him, confess'd that he did not know of any author who had made mention of it.

For I have certainly seen it taken notice of, from Platerus, in this section of the Sepulchretum (*f*); and in the last foregoing section, that is the twenty-third (*g*), from Bartholin: and I have also read of it in Ruysch (*b*), who saw it more than once (*i*); as is justly refer'd to by Christian Andreas Kochius (*k*), where he also mentions another observation of a case of this kind, of Boerhaave's: to which, and the others, to omit here the analogous prolapsus of the bladder in women (*l*); of which, and the signs thereof, you may, in the mean while, consult Mery himself (*m*) and the celebrated Bassius (*n*); you will also add that which the very learned Valcaarenghus (*o*) made upon a nobleman.

But if this case be rare; in which, when it happens, it is in our power (and this is the proper and pathognomonic sign of the disease) to discharge the urine from the bladder, which the patient raises up with his hand, together with the scrotum, or compresses; there are others that are frequent, as those from a pretty large calculus: and if we attend to Hoffmann (*p*); who explains one of his observations (*q*), and dissections, in this manner in particular, from a spasm of the bladder itself; others that are less frequent; as from the external coats of the bladder, as was seen by the same author (*r*), being eroded, and very much lacerated, by a foetid pus, which had fallen down into the pelvis from the left kidney, that was entirely consum'd and destroy'd by an ulcer, or even as from tubercles; there are, I say, other suppressions of urine in the bladder, wherein, not only no assistance is given by the application of stimuli, but much detriment must be the consequence.

And there are tubercles sometimes in the bladder, or at its neck; although, as is clearly demonstrated by Benevoli (*s*), whom I have quoted, even excellent physicians have been deceiv'd in supposing them. There are, I say: for

(*c*) Dec. obs. 3. n. 5.

(*d*) Dissert. 2.

(*e*) Mem. de l'Acad. R. des Sc. a. 1713.

(*f*) Obs. 17. §. 4. in Schol.

(*g*) Obs. 4. §. 4.

(*b*) Cent. obs. 98.

(*i*) Advers. Anat. dec. 2. n. 9.

(*k*) Affect. in libr. & cat. rar. Deser. in Racin.

(*l*) Vid. tamen & Epist. 43. n. 14.

(*m*) Mem. cit.

(*n*) Dec. 3. Obs. Anat. Chir. 2.

(*o*) Dissert. de Saxi, Acub. & cat.

(*p*) C. 7. supra ad n. 11. cit. Epicr. obs. 1.

(*q*) Ibid.

(*r*) Ibid. obs. 8.

(*s*) Diss. 2. cit.

although Ruysch (*t*) represents only one example; yet that many are to be met with, he sufficiently shows in the subjoin'd observation (*u*).

What tubercles were seen by Drelincurt (*x*), what an excrescence was found by Sylvius (*y*), what a caruncle by Tulpus (*z*), by Smetius (*a*), by Hildanus (*b*), you have, not to lead you too far, in the Sepulchretum itself, where you will also certainly find other things relating to the same subject. And perhaps you will still remember that which I formerly describ'd in the first *Epistola Anatomica* (*c*), as being found by me, as well in the urinary, as in the biliary bladder.

And although it is superfluous to produce examples of tubercles, which arise in the meatus urinarius, since mention is made of them in the very aphorisms of Hippocrates (*d*), and of the suppuration whereby they are remov'd; yet I suppose it will not be displeasing to you, if to the history of that nun, who was preserv'd for the space of sixty-six days, by the help of nourishing glysters, under the attendance and care of Rammazzini (*e*); I add this also, which I receiv'd from him: I mean that the same virgin; when she was, afterwards, seiz'd with a suppression of urine, and refus'd the assistance of the catheter; after the case had gone on to an extremity, by the delay of some days; had begun to discharge her urine, together with a small quantity of pus, without any pain, except of the urethra: and by this had shewn the cause of the disorder to be a tubercle form'd in the urethra. And as the well-tim'd suppuration, of this tubercle, took away the disease, so the irritating powers, of the remedies spoken of above, would have increas'd it.

But tubercles of this kind may, however, easily be chang'd into pus, and leave the passage free and open. But who can have any reasonable hope, that scirrhus tumours, or tumours verging to the hardness of a scirrhus; such as are often found in the prostate gland, or frequently grow out therefrom; may be easily remov'd by nature herself, not to say by art? And such I believe that excrescence of this gland to have been which is describ'd above (*f*), from the observation of Valsalva: and of the same kind, without doubt, was the tumour of the whole prostate, in the following observation of mine.

13. A fellow-citizen of mine, of noble birth; who was more than sixty years of age, of a square and robust body, had a red face, a habit inclining to fatness, and was troubled with a hernia; had labour'd, when a young man, under a virulent gonorrhœa, and had always drunk very freely, and often even of pure wine.

Though he also made a great quantity of water, and very frequently; yet the year before he had been attack'd with a kind of slight retention of urine. And in the year 1710, on the fourth of March, it was almost suddenly suppress'd.

(*t*) Cent. obs. fig. 62.

(*u*) 78.

(*x*) Sect. hac 24. obs. 13. §. 2.

(*y*) Ibid. obs. 10. §. 6.

(*z*) Ibid. obs. 8.

(*a*) Sect. 25. obs. 1. §. 4.

(*b*) Ibid. in Schol. ad §. 2.

(*c*) N. 43.

(*d*) 82. sect. 4; & 59. sect. 7.

(*e*) Constitut. Epidem. Urb. a. 1691. n. 221.

(*f*) N. 6.

A physician, who was his kinsman, took great pains to administer relief by glysters, baths, and blood-letting from the hæmorrhoidal veins; and even by such remedies as increas'd the intestinal discharges, which were at the same time diminish'd: but to no purpose. He therefore, at length, order'd the catheter to be introduc'd: which was done without great difficulty, both then, and afterwards. And at each time of introducing it, almost seven pints of urine were drawn off, on the first days from the time it began first to be introduc'd; notwithstanding he had but little given him to drink.

On the intermediate days, for he liv'd, in all, about fifteen, the quantity was somewhat less: and on the last days the quantity again amounted to seven pints. And on the first days, indeed, he perceiv'd some inclination to make water; as he also did on the latter days: but none at all in the intermediate days. A little blood was sometimes seen in the urine; and sometimes, some small pieces of membranes as it were; on the last days a pain of one shoulder came on: a fever on the last but one: and on the last, in the morning, when the catheter was withdrawn, after taking away the urine, it was observ'd to be ting'd; which was a circumstance that had never happen'd before; just as if it had been dipp'd in a vitriolic fluid.

On that day, when the evening began to draw on, behold a rigor, and a tremor came on; though the skin continu'd warm; and from hence the pulse was obscur'd: and as soon as it began to be discover'd again, not without intermissions; another tremor came on: and at the fifth hour of the night the patient died.

Being ask'd to attend the dissection of the body, I attended, together with other physicians, about the beginning of the night of the following day: at which time I receiv'd the account I have given you, from the physician who had attended the patient while living; and from the surgeon and others; all of whom confirm'd the relation.

We found the peritonæum to be livid; particularly in the hypogastrium; and the intestines, in general, to be of a livid hue: in the extreme part of the fundus of the distended bladder, the blood-vessels were externally tumid with blood; and the internal coat was redish in several places: but all the coats were much thicker than they naturally are; for which reason the bladder, even when emptied of its urine, retain'd an unusual magnitude.

Before the whole of the urine was discharg'd from that cavity, we observ'd a coagulum, of no very small size, to be swimming freely about, and to resemble nothing more than a semi-lacerated hydatid; but when I examin'd it more attentively, it seem'd to be a slender polypous concretion, which resembled small membranes involv'd one in another, and collaps'd: and those who saw it affirm'd that it was of the same kind with those small fragments, which had sometimes appear'd in the urine, after being drawn away.

When, therefore, we came to inquire into the cause of this suppression, it appear'd to be at the lower part of the bladder. That is to say, the prostate gland was universally swollen out in a preternatural manner, and had attain'd to such a state of hardness, as to seem to those who cut into it, to consist of the substance of cartilage and ligament mix'd together as it were.

This tumefied gland was of a white colour; except that, in some places, but particularly on both surfaces, it was blackish, from blood stagnating in the vessels; and that most on the right side, where the scrotum was, in part, distended with a large enterocele.

14. In this cause of suppression, which has been just describ'd, all of us, who were present, easily agreed: not only because we were not ignorant that the same had been met with, at other times also, by eminent men, and acknowledg'd; as will be said afterwards (*g*); but also because it was easy to conceive, that when the patient began to be affected with a tumour, and hardness, of the prostate, he began also to be attack'd with the beginning, as it were, of a retention of urine: and that when the tumour was, at length, increas'd to such a great degree, an unusual slowness of circulation, through this gland, and round about this gland, coming suddenly on, the canal which pass'd through it, could not be sufficiently open'd for the discharge of the urine; unless by introducing the catheter which was a solid body.

Nor would I have you say, that the blood, which was discharg'd by the application of leaches to the neighbouring veins; a remedy that I have spoken much in praise of above (*b*); ought to have recover'd the former celerity of motion; and by this means have diminish'd the tumour. For in a full habit of this kind, blood not having been previously taken away from the arm, a greater quantity of this fluid easily flow'd to that part, from whence it ought to have been repell'd; by reason of less resistance being made to its influx.

I omit inquiring whether, on account of the baths also, which had been then made use of, this might happen; or even, whether a stimulus was added by those medicines, in particular, that were given to increase the intestinal discharges. I also omit this inquiry; whether the urine began to be drawn off later than it ought to have been: which was an objection I heard commonly made; at that time more than any other; though I said nothing about it myself, according to my usual custom; as every reflexion of this kind is superfluous, and useless to a patient who was already dead.

The cause of this objection, however, does not seem to be unworthy of our notice. It had happen'd in those days, that four other citizens, besides him of whom I have spoken, were suddenly seiz'd with the same disorder; and that what the celebrated Bassius (*i*) observ'd afterwards, at Hall in the dutchy of Magdebourg, in the spring of the year 1730, "to be quite unheard of;" I mean that a true gonorrhœa spread about epidemically; as he testifies, by producing four observations; we observ'd in the spring of the year 1710, at Forlì (a city not abounding with inhabitants, in proportion to the advantages it enjoys, nor as it formerly did) in regard to an ischuria vesicalis as it is call'd; five observations of which I could produce that were made within a few days, by-way of an uncommon instance, which perhaps might be explain'd nearly in the same manner that he has explain'd his, or, at least, in great measure.

The city therefore, seeing that out of our five citizens, one of whom I attended myself, four had recover'd; and he only, whose dissection you have

(*g*) N. 17.(*b*) N. 11.(*i*) Dec. 4. obs. anat. chir. 5.

read, had died; commended the foresight, and prudence, of the others, in the early introduction of the catheter, and blam'd the delay of this physician in question: but whether justly or unjustly, I leave to you to determine.

Yet as there are different causes of diseases in different persons, and different states of body, of the parts, and of the urine; so there may be different reasons, in different patients, why a physician should take any step instantly, or delay to take it for some time. I confess I was not sorry for having made use of the catheter so early, in my patient, after more easy remedies being tried to no purpose; although to the surgeon it seem'd so premature, that, by reason of the very small tension of the hypogastrium, he asserted that there was no urine in the bladder.

But he was immediately refuted: though not so much by the signs of a renal ischuria being absent, and by the other signs of a very troublesome vesical ischuria, being present, as by the thing itself.

For no sooner was the catheter introduc'd, but it brought off three pints of urine, to the great ease of the patient; who was surpriz'd how it could happen, that he, who drank so little, should have such a quantity of urine in his bladder: being ignorant, that, with this suppression, an affection of the diabetes kind, as it were, is frequently join'd; which consideration has sometimes led me to doubt, whether this disorder of the diabetes kind, were not the cause of the suppression: I mean by so hastily, and surprizingly, distending the bladder, while the patient sleeps, that when he awakes, the muscular coat thereof is no more able to contract itself.

But whether the patient; into whose bladder our Fabricius ab Aquapendente (*k*) says that so great a quantity of urine had flow'd (while nature was bringing about a crisis) that, he not being able to discharge it, there was a necessity of drawing it off by the catheter; whether this patient, I say, slept like mine; or whether, as he lay ill of a continual and dangerous fever, his sensations were become obtuse; as we do not certainly know, so we are at liberty to suspect either the one or the other: for it does not, otherwise, appear, why he did not discharge his urine from the time it began to flow, pretty plentifully, into the bladder; and why, by continuing this discharge, he did not take care to prevent the whole quantity, that was secreted, from being retain'd in the bladder.

15. That you may not inquire after examples of the conjunction of both these disorders, which I spoke of just now among other authors; that is to say, of the diabetes and the ischuria, of which kind in particular was that of Hildanus in the Sepulchretum, which having some reference to the case of the old man mention'd above (*l*), is transfer'd into this section under article the eighth of the tenth observation, but of that which stands first in order (for another observation immediately succeeds, which is, through carelessness, mark'd out by the same number) and that I may not add other more recent examples which have come to my knowledge; it is sufficient to read over again the history in question (*m*).

You will see, notwithstanding the patient then drank but little, how great a quantity of urine flow'd down into the bladder. I am sorry we did not ex-

(*k*) De Chirurg. Operat. ubi de urin. Supress.

(*l*) N. 9.

(*m*) N. 13.

amine his kidneys and liver. Yet I am not sorry, for this reason; because I should have hop'd that I could learn out the cause of those circumstances which happen in the diabetes.

For to set aside the more wonderful things that are related of the true diabetes (*n*), some of which, I think, ought not to be admitted without a cautious examination; it is certainly not less surprizing to consider what has, beyond a doubt, happen'd in two virgins in the spurious diabetes, as it is call'd; and that even in our age, and neighbourhood, at Venice (*o*), and Bologna (*p*); so that one of them, within ninety-four days, discharg'd three thousand six hundred and seventy-four pints of urine: and the other, within ninety-seven days, discharg'd four thousand one hundred and seventy one pints of the same fluid; whereas both of them not only drank little, or nothing, but even, almost like those who labour under a hydrophobia, were extremely thirsty, and abhor'd the sight of any kind of liquor whatever.

You certainly perceive, that, whatever morbid appearances may be found in the kidneys, or liver; for Mead (*q*) asserts that "something steatomatous" had been "always" found, by him, in this last-mention'd viscus, by dissecting the bodies of those who had died of a diabetes; you certainly, I say, perceive, that it cannot for that reason appear, from whence, I do not say to great a quantity of fluid, but even a quantity less by one half, is to be accounted for.

For which reason, they who have undertaken to explain the cases of these virgins, have been oblig'd to do the same thing that Mead has, at length, expressly done (*r*); and that physicians had already begun to do (*s*) in the fifteenth century; I mean to have recourse to the air, and, with greater propriety than those ancient authors, to deduce this immense quantity of urine, not from the air itself, but from the aqueous particles swimming therein.

It therefore chagrines me, that I did not examine into the state of those viscera which I have mention'd: not because I might have had an opportunity of observing the cause of the surprizing cases of this kind, but because I might have, in part, observ'd some traces of the cause of a diabetes not so immoderate; or, perhaps, rather some traces of the effects. And I am so much the more displeas'd with myself, as there are very few dissections of persons who died after that disease.

This circumstance appears from the shortness of that section of the Sepulchretum, which profess'dly treats of the diabetes; I mean the twenty-sixth. Of the observations, however, contain'd therein; which are, in number, no more than five; there are three which either represent both the kidneys as being very flaccid; or one of them, at least, as collaps'd into itself, or almost consum'd.

With these agree the two observations of Ruysch (*t*), which I wonder were not added; for Hoffmann (*u*) had not publish'd his at that time. Which

(*n*) Vid. supra, n. 2.

(*o*) Caso proposto da Bartol. Barati & Lodovico Testi con la Risposta di questo.

(*p*) Comment. de Bonon. Sc. Instit. t. 1. sub. tit. Medic.

(*q*) Expof. Mechan. Venen. Tent. 1.

(*r*) Monit. Med. c. 9. sect. 2.

(*s*) Vid. Marc. donat. c. 27. supra ad n. 2. cit.

(*t*) Obs. addit. ad Dilucid. Valvular 13. & cent. obs. 13.

(*u*) Consult. Med. cent. 2. cas. 85.

likewise; although it also supposes the diabetes to proceed from a previous retention of urine in the kidneys, and ureters, from whence a great quantity thereof returns back into the blood, and must of course be again secreted, in a great quantity, when the cause of the retention is remov'd; nevertheless brings us back to this supposition, that the pores of the kidney were relax'd, by this very retention, and return of the urine; as in a certain Count, who had labour'd under a diabetes, not only the kidney on the right side was enlarg'd to more than double the size of that on the left, but the ureter appear'd to be extremely dilated, almost to the size of a common sausage.

And I myself also; though I would by no means follow this explication in all cases; as in all a retention of urine does not precede, and the quantity, in which many discharge it, far exceeds whatever might be retain'd and return'd into the blood; in the case of the man, nevertheless, whose history I have given, and other cases similar thereto, shall follow it without any difficulty: as they not only secrete a much less quantity of urine, and secrete it after retention; but, in this man in particular: because; as he was always us'd to drink a great quantity, and make a great quantity of urine, before his ischuria came on; the kidneys seem to have been lax to a considerable degree, even before the attack of the disorder.

But what mischief had been added by the fluid; which, when he at last drank but little, the kidneys transmitted in so large a quantity; I could perhaps better conjecture, if I had examin'd all the different urines.

For as to their bringing on some stimulus to discharge the bladder of its contents, on the first and the last days of the disease, and none in the intermediate days; this might much more easily happen from their quantity, than from their nature; since the fluid was secreted in much less quantity, in the intermediate days, and in a greater quantity on the first, and the last: unless you should rather choose to suppose, that the sensation of the bladder had been blunted, by the frequent distention; so that in the intermediate days it was no more affected, till, by reason of the patient's drinking but a small quantity, and by reason of a large quantity of fluid being secreted from the blood, the urine, at length, became so much more acrid, as even to excite in some measure the obtuse sensations of the bladder: at which time it also began to excite some inflammation, here and there, in that viscus.

16. But if I had seen any erosion, as well as inflammation, on the internal surface of the bladder, I should perhaps have examin'd less into the nature of that coagulum, which had the form of a membrane: and which, being found in the urine, contain'd in the bladder after death, I suppos'd to be a poly-pous concretion; as I might then have suppos'd it to be made up of lamellæ, that had fallen off from the internal membrane: for the controversy which, as I have heard, did at length, arise some years ago, was not agitated at that time; I mean whether this circumstance could possibly take place without a hæmorrhage that could not be appeas'd.

But certainly, a hæmorrhage of this kind had not happen'd in the matron mention'd by Willis (x), who having, long before death, discharg'd from her

urethra, “ a thick and broad membrane, fill’d with sandy matter;” it appear’d from the dissection of the body, that this membrane “ was a part of the “ internal coat of the bladder :” nor did it afterwards happen in two women, each of whom discharg’d, from the urinary meatus, a large membrane that was examin’d by Ruysch (y) and Boerhaave (z); and one of them “ sprink-
“ led over, as it were, with small calculi.”

And it is not to be suppos’d, that such men had taken *pseudo-membranæ*, or false membranes, for true ones; especially as Ruysch had taught (a), many years before, the manner in which not only nature, but even art, might make false membranes: and had himself made them.

Be this as it will, however; that certainly was not a false membrane, which Robault (b) had before seen discharg’d from the same passage, in a man; as he found three portions of it only, to be of such a large size, that he did not doubt but they had made up two third parts of the internal membrane of the bladder: for it was furnish’d with regular blood-vessels: and so far was there from being any hæmorrhage join’d with it, which could not be restrain’d, that the urine never appear’d to be so much as tinctur’d with blood.

It is true, I do not contend that whatever comes out of the bladder in the form of a membrane, is really a membrane; as I did not judge it to be so in my fellow-citizen. But this I contend for; that the marks of membranes are nevertheless sometimes so manifest, that we cannot argue against the opinion of those very experienc’d men who examin’d them, and took them for real membranes: nor are we immediately, and upon every occasion, to go so far as to deny the facts, because we cannot conceive how some things can happen without the most violent, and even the most fatal symptoms. I would therefore have you suppose what I have said on a former occasion in a similar controversy, upon any internal membrane absceding (c), in great measure to take place here also.

17. I now come to the cause of the suppression; which was found to consist in the prostate gland being very tumid, and hard. I had learn’d that this cause was not uncommon, from the observations of those who are quoted in the Sepulchretum; that is to say of Riolanus (d) Muraltus (e), Dolæus (f), and even, as I understand it, of Reiselius also (g): I have not said from those of others likewise and among these, of him who ought to have been nam’d in preference to the rest, that is of Parey (h), because we do not here consider the magnitude only, but the scirrhus hardness also.

And I have since been confirm’d in the opinion, both by observations of this kind, that I have heard, and read, and such as have been made since the others. I have heard of it in two men of note here at Padua, who were very well known to me. And I have read of it, not only in other authors, but particularly in the celebrated Heister (i): and if you attend to the increas’d

(y) Advers. Anat. Dec. 2. n. 9.
(z) Vid Kochii cit. supra ad n. 12. descript.
in historia.
(a) Thes. Anat. 7. n. 39.
(b) Hist. de l’Acad. R. des Sc. A. 1714, obs.
Anat. 1.
(c) Epist. 31. n. 20.
(d) Sect. hac 24. obs. 17. §. 5.

(e) Sect. 25. in additam. obs. 16.
(f) Ibid. obs. 17.
(g) Ibid. obs. 18.
(h) Sect. ead. obs. 1. §. 6.
(i) Instit. Chirurg. p. 2. f. 5. c. 44. n. 1. &
Diff. de Anat. Maj. in chir. necess. c. 1. f. 4.
§. 3. an. 4.

bulk of the gland only, I read of it, likewise, in the works of two of my most respectable friends, Vallisneri (*k*), and Benevoli (*l*); to whom you may join Riedlinus (*m*).

But the whole prostate gland is not always tumid. For frequently, only the superior circumference of it either grows out on every side, or on a particular part; and swells to such a degree, as to prevent the exclusion of the urine. I think I can point out examples from the Sepulchretum, of its being so tumid as to have this effect: and I have many observations of its beginning to grow out: and these, that you may know what are the small beginnings of great disorders, I will take the trouble to subjoin here, in order, after the former.

Rhodium (*n*) describes an old man, in this section of the Sepulchretum, in whom the discharge of his urine had been render'd very difficult by degrees; and finally, mucus being added, was entirely obstructed; by "a callous appendage growing internally to the orifice of the bladder alone: and still more by the internal membranous circumference of the orifice growing out into the size of a joint." He certainly might have describ'd the case more clearly; as another likewise, might have done, by whom you will read the same orifice of Casaubon, who was so much troubled with disorders of the bladder, describ'd in the next section of the Sepulchretum (*o*); which description is moreover render'd obscure by typographical errors.

But if I rightly conceive of what both of them have seen; the circumference of that orifice, which is made by the upper part of the prostate, was rais'd up by too great a protuberance of the gland. And I have seen that upper circumference, of the same gland, beginning to grow out on all sides; in an old man whose history I shall send you when I treat of fevers (*p*). And I believe that which is given in this section (*q*), from Gassendus, of "a caruncle, or callous substance, at the sphincter of the bladder, that, being lunated in its lower part, and almost as thick as the third of an inch, obstructed the orifice of the meatus," to relate to a part of this circumference.

And although you have already had an example, from me, of this incipient caruncle, in the thirty-seventh letter (*r*); and are to have another also, in one of the following letters (*s*); yet I have a mind to add a third here, in consequence of its being short, and relating, in general, only to this circumstance.

18. A husbandman, of seventy-five years of age, had died in this hospital of an ascites, in the beginning of the year 1741; which was the time when I was demonstrating, anatomically, to the students, the organs destin'd to the secretion of the urine and semen.

These organs, therefore, were taken out from the body, and were the only parts I examin'd. And therein I not only met with some other appearances that are not very frequent, though not morbid, which will be taken notice of elsewhere; but I observ'd the following things in particular, which had a relation to disease.

As the scrotum was swell'd, as it frequently is in an ascites, there was a great quantity of water in the cells of the dartos, and but little within either

(*k*) Opere t. 3. f. 3. off. 21. 22.

(*l*) Dissert. 2.

(*m*) Eph. n. c. Dec. 3. A. 9. & 10 obs. 148.

(*n*) Obs. 12. §. 3.

(*o*) Obs. 3.

(*p*) Epist. 49. n. 18.

(*q*) Obs. 12. §. 10.

(*r*) N. 30.

(*s*) Epist. 43. n. 24.

tunica vaginalis: notwithstanding from the albuginea, where it invests the testicle, such small bodies were protuberant, as are generally look'd upon, by me, to be the remains of ruptur'd hydatids.

And when the anterior paries of the bladder was cut asunder longitudinally; in that part of the opposite paries, which is nearest to the orifice, and in the very middle of this part, a roundish protuberance appear'd: being of the bigness of a small grape, cover'd over with the internal coat of the bladder. What this protuberance was I readily suppos'd; and by forcing the knife into it, I cut through this and the contiguous prostate gland, at the same time, lengthways, and shew'd that it was of the same nature with that gland: that it was very evidently continued from it; and that there was no doubt, but, if it had grown out to a greater degree, it must have been a very considerable impediment to the discharge of the urine.

19. If you attentively examine those examples which I have pointed out from the Sepulchretum (*t*), and that which I have produc'd above (*u*), from Valsalva, and mine; you will observe that they were all from old men: and, in like manner, if you examine all my observations in which there was the beginning of a caruncle, you will find that this was found to grow out in the very middle of the internal, and upper, circumference of the gland, posteriorly; but whether all these things happen'd by chance, or otherwise, future observations will show.

In the mean while, you may add, to these other examples, that old physician, whom one of the observations, refer'd to in Vallisneri (*x*), shows to have had the whole prostate gland tumid indeed, but increas'd with a particular lobe, as it were, from its glandular substance; which rose up within the bladder, in the shape, and size, of a walnut: not on the anterior part, but on that which lies adjacent to the intestinum rectum.

Yet that roundish protuberance of the same gland, which is taken notice of in the Adversaria (*y*); except that it rais'd itself up from the external circumference, and seem'd as yet to be in a natural state; that protuberance, I say, occupied, in like manner, the middle and upper part posteriorly.

However, those internal excrescences of this gland that are preternatural, are not always simple, but sometimes even in a double state; of which kind were those found by Thomas Bartholin, at Padua, that he describes under the appearance of "two tubercles, consisting of a white and glandular substance, " of the figure and size of the testes; rising up equally above the foramen, " within the bladder; yielding to a syringe when introduc'd, but falling immediately back into their former situation when that was withdrawn;" as you have it in this twenty-fourth section of the Sepulchretum (*z*).

These two tubercles Terraneus (*a*) would never have taken for Cowper's glands (which he suppos'd to be discover'd by him) swell'd to a considerable degree, if, when reading Bartholin, he had taken notice that they were found "in the bladder." But it is probable that he did read the passage: and I wish this was the only thing I could accuse him of; since being desirous of collecting observations from any author, and transcribing them, he has told us

(*t*) N. 17.

(*u*) N. 6.

(*x*) Supra, ad n. 17.

(*y*) IV. Animad. 14.

(*z*) Obs. 12. §. 9.

(*a*) De Glandul. c. 5.

hat this observation of Bartholin is to be found “in century the first, history ‘the twenty-third;’” whereas it is really to be met with in the second century, history the fifty-second.

But if these tubercles had grown out from the prostate gland, as their nature, colour, and situation, demonstrate; and, as the two others, which I have already describ’d to you (*b*), in some measure show; I have also a recent example of this gland beginning to shoot out, into two caruncles, within the bladder. But this example, as for another reason it belongs to the next letter (*c*), I will delay to produce till then. And that letter will be long, in the same proportion as this is short. Farewell.

(*b*) Epist. 39. n. 33.

(*c*) Vid. n. 11.

LETTER the FORTY-SECOND

Treats of the difficulty of making Water, the Ardor-urinae and other Disorders in which the Urine is concern’d.

I Am going now to give you a long letter; as I intend to comprize therein, every thing that remains among the observations relative to disorders wherein the urine is concern’d, made by Valsalva or by me. What follows is from Valsalva.

2. A knight of six and forty years of age, who had been formerly fat, but was now slender, and of a yellow complexion inclining to paleness; had begun to be troubled, eight years before, with many and various disagreeable symptoms, on account of many and various errors in his diet, exercise, attention of mind, watching, and venery.

First of all, being infected with the lues venerea, from lying with an infected woman, he was seiz’d with a gonorrhœa; which being cur’d by a proper medical regimen, was succeeded by another more violent one, from the same cause.

For besides the pain in making water; an involuntary discharge of the urine, a purulent sediment thereof, a pain of the stomach in like manner, and vomitings; by means of which he sometimes threw up veal, that had been eaten five days before, without any change; were exceedingly troublesome.

Being

Being freed from all these complaints by the help of remedies, he was attack'd a third time, with the same kind of gonorrhœa, and from the same cause; the disorder being attended with spasmodic pains in making water, and continual watchings. Besides these symptoms, he had certain tumours of the condylomatous kind, within the extremity of the intestinum rectum; from which, for some weeks, and even for some months, blood was discharg'd every day, to the quantity of five or six ounces: so that the patient was already reduc'd to such a state of weakness, as to fall into swoonings whenever he attempted to walk.

To this flux of blood was join'd a diarrhœa; by which a yellow matter, and, sometimes, a matter of a different colour, was discharg'd. This diarrhœa continu'd quite to the day of his death: being at one time more mild, and at another time more violent; as the purulent sediment of his urine did also; and the frequent discharge of his urine attended with pain, which discharge was likewise almost always involuntary: but if the urine stagnated a little time in the bladder, by reason of the tenacious state of the matter, it excited a most severe pain; especially while the discharge thereof was attempted.

With all these different symptoms was he troubled for many years: his pulse being always quick, frequent, and turgid; though the other signs, which confirm the presence of a fever, were wanting. About fifteen days, only, before his death, having fat up very late, and indulg'd himself in playing at dice; whereby he lost a considerable sum of money; he was so affected therefrom, both in body and mind, that he went to bed with a vomiting and a fever, which began with a slight shivering and a heavy pain in his head.

In the mean while, the sediment of his urine was increas'd: and the pains in making water were increas'd: and these pains becoming still more and more violent, excited a singultus. Yet even this was appeas'd after many days: pustules, in the mean while, breaking out about the lips, and probably about the fauces also; as a pungent pain therein, a difficulty of swallowing, and a viscid and tenacious spitting, seem'd to show.

An itching, moreover, in the skin of the loins, which had been slight for about two years, exceedingly tormented the patient at times, for some weeks before his death. Finally, the singultus returning, and the strength of the patient failing every day, he died convuls'd.

The thorax being open'd; in consequence of his having had a difficulty in lying down on one side on the last day of his life; the lungs were found to be sound: if you except some very small stony concretions that scarcely deserv'd notice.

But when the belly was open'd, the kidneys appear'd to be less than their natural size, of an unusual kind of figure, and to have many protuberances here and there externally. These tubercles, when cut into, show'd a sanious humour for which a passage was open'd into the pelvis. But in the urinary bladder; in which, particularly about its neck, the root of the disease was suppos'd to exist, by the unanimous consent of many learned men; nothing appear'd in any part that was worthy of remark, except a kind of slight erosion about the orifices of the ureters.

3. Valsalva suppos'd, and with very good reason, that this dissection might be a lesson of some importance; as it might make us cautious in determining the seats of diseases, when they relate to the urinary parts: the diagnosis of which, even when enquir'd into with the greatest skill, and accuracy, is very frequently deceitful; as it was in this case, and in another also, whereof I remember him to have given me the relation in this manner.

4. That a certain person labour'd under a disorder of his urine, and the parts serving to the secretion thereof; was evident to every body. Yet he complain'd very little of the kidneys, or of the region of these viscera; but, on the other hand, was tormented with such pains in the bladder, that five or six physicians, not of the meanest class, did not doubt but the seat of the disease was in the bladder.

When his body was dissected after death, not the least disorder appear'd in the bladder; but there were large and ramifying calculi in the kidneys.

5. I saw these calculi, which Valsalva kept by him.

And both of these histories brought to memory a third, which you will find transfer'd, from Harderus, into the section of the Sepulchretum, which relates to the subject in question; that is into the twenty-fifth (a). The case is of a boy of three years old; but, although he discover'd, by his gestures, the most violent pain in making water; he notwithstanding did not ever show any signs of pain in the kidneys that I read of.

I omit to take notice that this boy also, as well as that knight (b), had a perpetual diarrhœa; pustules not long before death, and even convulsions in death: for some of these may be from different causes in different persons. This circumstance, however, I attend to, "that nothing preternatural could be observ'd in the bladder;" but that in one of the kidneys there had been not only plenty of small sandy particles, included in the carunculæ papillares; and particularly, that before the mouth of the ureter, there had been "an oblong acuminate calculus, of the hardness of a flint, and tenaciously wrap'd up in membranes;" or, as Harderus himself explains it in the scholium, "intangled in very thin membranes of the kidney;" which "he was oblig'd to separate with a lancet."

Whether, therefore, an irritation be propagated from the kidneys to the bladder, by the continued membranes of the ureter; as I have already said on a former occasion (c); which is the most sensible where it terminates; or rather; whether in these cases, small particles of sand, or as the first history, by a slight erosion about the orifices of the ureters, seems to show, acrid particles of matter descend into the bladder; they so vellicate this viscus by stagnating there, that the most severe pains arise: and particularly while it is constricted, in order to discharge its contents.

At least a very acrid matter, flowing down from the corroded kidneys into the bladder, had so affected this reservoir, and the neighbouring parts, in a certain man, that the pain in the loins not continuing constantly as it did in the bladder, and bringing on "all the symptoms of a calculus confin'd there— in, there remain'd no doubt of the actual existence of this calculus" in the

(a) Obs. 10.

(b) Supra, n. 2.

(c) Epist. 40. n. 5.

breast of his physician, who was the celebrated Hottinger (*d*). Yet of such a calculus was not the least trace found after death.

And that you may the more and more understand, how easily we may fall into errors, in determining upon the cause of a dysuria; turn to the histories of two matrons: the one given by Schrockius (*e*), the other by Bonfiglius (*f*).

The first was tormented with a tenesmus, with pains in the pubes, and a kind of milky urine; the second had been afflicted with a dysuria from her very infancy, with urine sometimes of the same kind; to which, at last; many small foliated membranes, as it were, "were added:" which had not been discharg'd without the sensation of a very heavy weight, a pain, and an ardor.

Yet in neither of them was found any disease of the bladder; but in the second, one of the kidneys was internally diseas'd, and prolaps'd from its seat, in consequence of its bulk being increas'd: and in the first was a large scirrhus, which, occupying almost the whole pelvis, and growing to the fundus of the bladder, so compress'd this reservoir, that the acrimony of the urine, retain'd thereby, gave the most excruciating pain.

6. Valsalva very solicitously enquir'd after another cause, whereby the bladder may sometimes be vellicated: but he could never confirm the existence of it by dissection; I mean of worms residing in this cavity. I know however, that worms, discharg'd together with the urine, as the patients and their domestics imagin'd, have been more than once offer'd to his inspection.

For I was at Bologna, when a gentleman; who, after pains of the kidneys, and a succeeding sense of pricking in the bladder, finding, at length, that his urethra was prick'd in the same manner, at the time of making water; saw a kind of slender animalcule fall from the urethra, together with his urine: and soon after, examining the urine he had discharg'd, he not only saw this one in the chamber-pot, but even many other animalcules of the same kind, together with sandy concretions; which appearances he shew'd to Valsalva, who was his physician.

Valsalva had happen'd, at that time, to give the patient liquor in which the root of saxifrage had been boil'd: he therefore order'd them to be taken out of the urine, living as they were, and thrown into a glass of this decoction; from whence they lost their vivacity, became stupid, and seem'd almost dead, yet, after two days, having shaken off this stupor, they were thrown into several different waters, for the sake of experiment; in each of which waters, different ingredients, suppos'd to be inimical to worms, were boil'd, and agitated; but none of these waters was observ'd to affect them so much as the former, except one, in which not only such things as are suppos'd to expel sand, and gravel, had been boil'd, but even quick-silver had been agitated.

These animalcules were black; and, in some measure, similar to those worms that we see in dry wood: which circumstance, at length, put Valsalva upon inquiring whether others of the same kind could not be found in the patient's bed-chamber, or where the chamber-pot was at any time kept.

(*d*) Eph. n. c. Dec. 3. A. 9. & 10. obs.

(*e*) Earund. cent. 1. & 2. obs. 186.

232.

(*f*) Earund. cent. 9. obs. 4.

And these animalcules being actually found, there was an end to all his experiments: yet he did not seem entirely to have laid down his former suspicion; especially as other animalcules were brought to him, which were said to have been discharg'd in the urine of another patient, together with a fabulous matter.

One of these Valsalva shew'd to me; and took care that it should be drawn to the life, even by the help of a microscope: yet I shall say nothing upon the subject; since Alghisi, in his letter to Vallisneri (g), has told us what appear'd to him from hence: and has, at the same time, given a figure of the animalcules: and Vallisneri has suppos'd he might suspect from hence, that they were the off-spring of those black flies, or worms, which make their nidusses in timber; and that they had happen'd to fall from the cielings into the chamber-pot: for thus he wrote to me on the fourth day of April in the year 1711.

But the same Vallisneri seems, since that, in an annotation (b) to the letter of Alghisi, to be almost inclin'd to believe, or, at least, suspect, that some very small, and almost, invisible worms; which he at that time saw in the urine of a man, who was his patient; might have been generated within his body.

This therefore being, at present, the state of the question; since Vallisneri did not, as far as I know, determine any thing, afterwards, for certain, in regard to these worms; it is proper that we also should withhold our assent in the mean while; either till chance presents us with more certain appearances, or the skilfulness of some gentleman, extremely well vers'd in the history of insects, such as the celebrated Reaumur is at this time, shall make deeper recherches into the subject.

For as the study of natural history, and that of insects in particular, is carried to such a height of improvement in our age, physicians have been thereby render'd the more cautious in giving credit to observations of this kind. See, for instance, the great number of histories which are related by Johannes Rhodius (i), and Dominicus de Marinis (k).

Out of so great a number of worms, which were formerly said to be discharg'd by the urethra, we should, at this time, immediately know that some were nothing else but polypous concretions in the shape of worms; that others were real worms indeed, yet had not fallen from the urethra, but, externally, from some other place, into the chamber pots; inasmuch as they were of that kind which cannot be generated within the body, nor live therein: or if they did really come from the urethra, it would appear that they were not generated in the urinary parts, but in the intestines which had been perforated; from whence they had crept into the bladder, or urethra: the passages being open'd by abscesses, and by fistulas in particular.

An example of this last kind is pointed out by Vallisneri (l): and Alghisi (m) relates another of his own, that he was afterwards better acquainted with;

(g) Quam vid. tom. 1. hujus Operum, p. 5.

(b) Ibid.

(i) Cent. 3. Obs. Med. 35 & 36.

(k) Dissert. de remonstr. a Capuce. & cæt.

(l) Adnot. cit.

(m) Loc. cit.

from dissection; which confirm'd him in his opinion of the case (*n*). You have, also, in the Sepulchretum (*o*), more than one example of perforations of this kind: and if, in these patients, round worms, or ascarides, came forth by the urethra; there was nothing therein which could greatly excite our wonder.

But when, in this twenty-fifth section (*p*), you read of the dissection of a man, who had, while living, discharg'd two ascarides in his urine; and that, in his bladder which was ulcerated, one worm was found, "like those that "are found in putrid flesh;" you must hesitate, and doubt whether there was not some sinus, which had been unobserv'd, going from that ulcer, and reaching to the intestinum rectum: and whether the ascarides had not pass'd over, from thence into the bladder; or rather whether those ascarides; altho' they had been found by the patient, himself, "in a living and active state, and creeping upon the glans penis, itself;" had nevertheless not come from the urethra, but from the anus, together with some part of the excrementitious matter; and by this means had crept on to the penis.

But in regard to that worm which was quite of another species, and which was found in an ulcer of the bladder; if however it was a real worm; and taking this for granted, if not carried thither by sponges; or some other accident; you may suppose that it was brought forth by its mother-fly, near the external orifice of the urethra, which was infected with a putrid ichor: and that it had crept through this canal quite into the bladder: but that this had happen'd after the patient's death, and not while he was yet living.

For neither would the sphincter of the bladder, unless quite relax'd, have suffer'd any thing to have access to the cavity thereof; nor would the man have fail'd to feel the motion of this insect creeping through the urethra; unless quite destitute of sensation; and in consequence thereof would have had a stimulus to make water: and by this means, the animalcule must have been thrown out, together with the urine, immediately, as soon as ever it had enter'd the urethra: and I am surpriz'd that Ruysch did not sufficiently attend to this (*q*), when he suppos'd that worms might creep, from their lurking-places, through the urethra, quite to the neck of the bladder, and remain there till they put on the form of *nymphae*; on which supposition another very great difficulty, in the opinion of Vallisneri (*r*), offers itself to our consideration.

7. What then? you will say, among all the many examples that Georgius Francus (*s*), Rosinus Lentilius (*t*), Mich. Fr. Lochnerus (*u*), have reckon'd up, do not some, at least, occur, that are plac'd beyond all possibility of doubt?

I am not at leisure to examine them all. But this I can say; that many of them are of the same kind with those spokken of before: and as they were all read over by Vallisneri; for those volumes, wherein these enumerations are contain'd, were publish'd many years before his death, and perus'd by him;

(*n*) Vid Benevoli Offerv. 8.

(*o*) Sect. 27. l. 3. obs. 1.

(*p*) In Additam. obs. 20.

(*q*) Thef. Anat. 1. in fine.

(*r*) Adnot. cit.

(*s*) Eph. n. c. dec. 3. a. 4. obs. 2.

(*t*) Earund. cent. 1 & 2. Append. n. 11. ad obs. 14.

(*u*) Earund. cent. 8. obs. 99.

he, nevertheless, found no instance whatever, among them, as far as I know, from which he thought it necessary to change his opinion entirely.

He did not call into question the credit of the authors who had written; but, in some he wish'd for a greater share of sagacity, in some more diligence, and in others a prudent method of suspecting and doubting; so that, unless they had consider'd all the symptoms which had preceded, all which attended, and succeeded, they should not suppose themselves to have made a sufficient enquiry. After his death other examples came forth; one of which it appears had been communicated to him.

But he certainly could not have read those that are extant in the *Commercium Litterarium* (x). And if he could have read them; he, indeed, without doubt, would have paid great deference to the illustrious and every way respectable observers, as I myself do; he would, nevertheless, probably have wish'd, that almost all of them, in general, had not happen'd in that sex which is so prone to deceive; a circumstance that is taken notice of by one of the observers; and, in like manner, that the worms had been describ'd in some, in some that they had been really seen alive; and in others that both the description, and the representation, had not naturally given us a suspicion of polypous concretions.

For you know how suspicious he was in making his own observations; and, if you please, even difficult. However, in judging of the observations of others, he has had Daniel le Clerc (y), for a follower of his morose cautiousness; and even Lochner (z) himself, and his friend Godfrey Thomafius (a). But these authors, you will say, except to some only, of the many observations, wherein worms are said to have been discharg'd from the urethra. Nor do I obstinately deny them all. I only wait for some person to confirm, by his more clear, and less exceptionable examples, some observations on which I have less hesitation.

But if these observations seem, to you, to be plac'd beyond all doubt, you are at liberty to admit them for me; so you do but confess, that these appearances, which were then so frequent, and almost innumerable, according to this supposition, are now reduc'd to a few, and happen but seldom. And this will appear so much the more striking, if we consider those which have hitherto been examin'd by dissection. What was more similar to a worm, than that which the celebrated Kneller (b) has describ'd, as being thrown out of the urethra, after very violent pains of the urinary passages? But when a more accurate examination was made, he himself found that what he had taken for a worm, was nothing else but coagulated blood, surrounded with a kind of slender coat.

And even those which were discharg'd in a very great number, by a man of distinction, through the same passage, "were fully and perfectly like" the round worms of the intestines; as the accurate description of Thomafius (c) shows: so that "the rumour, of so unusual a thing, was spread abroad

(x) A. 1731. Spec. 27. n. 5; & a. 1734. hebd. 39. post. n. 4; & a. 1735. hebd. 36. n. 3. & a. 1743. hebd. 49. n. 3. ut omittatur a. 1745. hebd. 4. n. 2. & cæt.

(y) Hist. lat. Lumbric. c. 13. ubi. de Vermib. cum Urina Excret.

(z) Obs. 99. cit.

(a) Obs. 100. seq.

(b) Act. n. c. tom. 5. obs. 75.

(c) Obs. cit. 100.

“ through the city, quick almost as thought.” The nidus of which worms, being inquir’d after in the dead body, in the other parts destin’d to the offices of excreting the urine; it was at length found, from the state of the left kidney, and its ureter, that they had been nothing more than inanimate concretions of fæculent and viscid blood, collected together in these passages, and dispos’d into that form.

And when true worms had been discharg’d from the bladder, Alghifi learn’d from dissections; as I have said above (*d*); and another author refer’d to by Vallisneri, that is the celebrated Reinholdus Wagner (*e*), learn’d also by dissection; through what passages they had come thither from the intestines.

But now let us, at length, go on from a doubtful, or at least, very rare cause of a dysuria; I mean worms generated in the urinary organs; to a manifest and very frequent cause; that is to a stone of the bladder: although out of two dissections which I find, and no more, in the papers of Valsalva, of those that were affected with this disease; as I have given one of them already, in consequence of its having a more immediate relation to the apoplexy (*f*); one only remains, which relates to calculi of the bladder, and to their unsuccessful excision at the same time.

8. A boy, of nine years of age, had already labour’d for six years, under a calculus of the bladder. He was much troubled with it at intervals. He frequently discharg’d his urine involuntarily, and mix’d with certain filaments; yet that fluid was of a natural colour: unless when it sometimes became bloody from too great motion. The calculus sometimes could be felt by the finger, when introduc’d per anum, and at other times could not.

And a lithotomist having undertaken to extract this calculus; after having troubled the boy for a long time, drew forth a small stone with great force. And when he perceiv’d that another stone was contain’d in the bladder, he again tortur’d the boy to such a violent degree, that he said his pain was so excruciating as to suffocate him: at length he extracted a portion of the fractur’d stone.

Scarcely half an hour was elaps’d, when the boy began to vomit; complaining continually of a very great pain in the lower part of his belly. To these symptoms was added a slight tumour of the abdomen: and a fever attended by a great thirst; together with some difficulty of breathing, and a tossing of the whole body. He therefore died one and twenty hours after the extraction of the calculi.

His belly being open’d, the bladder, with its surrounding membranes, was found to be inflam’d; and about the cervix, on the anterior part, lacerated. In the cavity of it remain’d one half of the second calculus.

9. The unskilfulness, or rashness, of the lithotomist, in this case, certainly cannot be excus’d. Nor do I say this, because, when his finger was introduc’d into the anus, he sometimes could, and sometimes could not, perceive the calculi: for, in regard to this circumstance, we shall consider it presently (*g*).

(*d*) N. 6.

(*e*) Eph. n. c. cent. 1 & 2. obs. 170.

(*f*) Epist. 4. n. 2.

(*g*) N. 10.

But I say it for this reason, that it is certain he must not have made a sufficient opening for extracting the calculus; as he extracted a small stone with a very great force: for which reason the very circumstance Celsus (*b*) has warn'd us of, happen'd with very ill consequences; I mean that "the calculus, when taken away with force, makes a passage for itself, if a passage be not already made:" and thus; although, in children, the parts more easily yield to dilatation, which is one of the reasons why lithotomy is, for the most part, more successful in this age, than any other; in this case the bladder was, nevertheless, lacerated about its cervix.

Add to this the tediousness, and great painfulness, of the operation; and the breaking asunder of one of the stones; though we do not read of its being large; which probably would have been by no means necessary, if the passage had been made sufficiently wide; and which ought always to be avoided if there be no necessity: lest either the forceps should hurt the internal coat of the bladder, by intercepting it, or the parts of the stone, by flying asunder, should injure this thin membrane: or lest, while they are fought after by a long examination, and drawn forth, they give occasion of injuring the parts: or finally left any fragment of them, being left behind, should afford a new beginning to a calculus of the bladder.

If Hippocrates had forbid such a lithotomist as this, and others like him, from "cutting persons who labour under the stone;" this passage of his from the little book intitled *Jussurandum*, or the oath, would not have been so tortur'd.

But he forbid his disciples this, and commanded that "they should give place to men who were employ'd in surgery in the performance of this operation;" could he mean because he thought that the practice of surgery did not become a physician? As if he himself were not very much vers'd in the practice of it; or was it for fear he should expose his disciples to the slander, and contempt, of those who were only exercis'd in the cure of disorders of particular parts?

I should suppose so if, besides this one disease, he had likewise order'd the same thing to be done in other disorders of some certain parts. Why then did he except this one case only? I am rather inclin'd to be of opinion with those who suppose it to be excepted, as being liable to the most considerable danger among the others; and particularly at that time, when so many admonitions, precepts, and instruments, whereby the operation might be brought very near to its perfection, as it is in our days, had not yet been added. But let us return to the lithotomist of whom I had begun to speak.

10. As to his sometimes feeling, and sometimes not feeling, the calculi by introducing his finger into the anus, the cause of this circumstance may be manifold: nor does this happen less frequently to skilful, than to unskilful examiners.

The celebrated Jo. Anthony Galli certainly was, and is, a very skillful physician and surgeon; in which last capacity he was particularly famous: some years ago, this gentleman had been sent for from Bologna to Faenza, at the same time that I was also sent for from Forli, where I then happen'd to

be, to see a man of some eminence, who was affected with most of those symptoms that generally attend a stone of the bladder.

This experienc'd surgeon, by introducing his finger at that time, could by no means perceive the stone, which he had perceiv'd before; yet we did not conclude that there was no stone, for this reason, as the symptoms still continued. And we did not even conclude so afterwards, when they seem'd to have vanish'd.

For I was inform'd by the patient; about a month after that day, when the gout, (to which he had formerly been subject, and after that had not been any more troubled with, for a long time) had return'd upon him suddenly, and all the disagreeable symptoms of his bladder had gone away at the same time; that he therefore did not doubt but I should come over to his opinion as he wish'd: I mean that all the symptoms of which he had complain'd to so great a degree, when I was present, had not been owing to a calculus, but to a gouty matter irritating the bladder.

I answer'd him, however, still in this manner; that as I had not pronounc'd, from the symptoms whereof he complain'd before, that he certainly labour'd under a calculus, because he had not been willing to admit of the catheter; from whence, perhaps, an undoubted sign of its existence, would have offer'd itself in the sounding of the stone against the catheter; so neither could I, from the obscurity of those symptoms; which perhaps was owing to the urine being become less acrid, by reason of the irritating particles being then carried to some other part; for a certainty deny that there was a stone: not even if the catheter were introduc'd, and no sound could be perceiv'd.

For I was not ignorant that some lithotomists, while I stood by them, and even that Cheselden himself (*i*) as well as others, have not been able to perceive the stone; even after three times introducing the catheter: notwithstanding one was really in the bladder.

And in fact, when I had return'd to Padua, it was signified to me, in the name of the patient, that as he was not able any longer to endure the former symptoms, which were now return'd; he had taken care to have the calculus, which was perceiv'd with the catheter, successfully extracted by incision.

And indeed that very experienc'd man Morand (*k*) has hinted, that pains of the bladder, from a calculus, sometimes lie dormant for many months together; and even for years: and you have in the preceding sections of the Sepulchretum, from Tulpus (*l*), and Nasius (*m*), examples of those persons; one of whom, "for the space of five years together," and the other "from childhood, quite to the age of five and thirty," had little, or nothing, of these very troublesome symptoms, of a stone in the bladder remaining: notwithstanding they had been before afflicted therewith, and had, even then, large calculi in their bladders; so that the first of them, like our Faventinus, believ'd that he never had a calculus.

I take no notice of others, who, never having made any complaint of this disease, had, after dying in a decrepit old age, either large calculi, or a great number of them, in the bladder; to the astonishment of every one: to whose

(*i*) Vid. Morand. Mem. de l'Acad. R. des
Sc. A. 1740.
(*k*) Ibid.

(*l*) Sect. 24. obs. 8.

(*m*) Sect. 23. obs. 7. §. 4.

three histories, that are in like manner describ'd in the Sepulchretum (*n*), I might add others; and in particular two from Alghisi (*o*); one of which, by reason of the perforation in the middle of the stone, is similar to the third of the former histories; which has Loffius for its author.

And in the year 1752, when I was teaching anatomy in the college, a perforated stone was brought to me, in the presence of many persons, by an eminent apothecary, whose shop is under the college; which stone was similar to that represented by Alghisi (*p*), except that the foramen was somewhat more narrow. He told us that it had been discharg'd, some days before, without any other assistance than that of nature, and the hand of the woman herself, in whose bladder it had been form'd.

And I suppos'd that this calculus, and every other of the same kind, if there have been any beside that of Alghisi, had been form'd in the shape of a ring, in the lower part of the bladder, about the orifice of the urethra; where the upper part of the prostate, or, in the female sex, the corpus glandosum, as it is call'd, is sometimes so prominent on the inside of the bladder all round, that the neighbouring parietes of this receptacle subside thereabout. Which prominence, and subsiding; though in the most healthy bodies, as I have said in a former work (*q*), they are generally found to be inconsiderable, or scarcely observable; may nevertheless, at other times, be somewhat larger in different bodies,

The fabulous and viscid particles, therefore, remaining behind after the last drops of urine, may sometimes, in those who abound therewith, concreate by degrees in this subsiding part; and receive an annular form therefrom, as if cast in a mould; be there increas'd, and stagnate; till an unusual situation, or motion, of body, or some other cause, may dislodge it from thence, and raise it up: and so by accident push it into the urethra, which in women is generally pretty wide and dilatable, as happen'd to this woman; and that with so much the more ease, as the circumference of the stone approach'd, in some measure, to an elliptical figure; one extremity of which was a little narrower than the other.

The patient, by whom this stone had been voided, was a virgin of eighty-two years of age: and she had never been admonish'd by any pain, or troublesome sensation, that she labour'd under a calculus of the bladder; except that she had remark'd her urine to have been discharg'd in a more slender, or thread-like stream, than usual; till the calculus, having fallen into the urethra, excited pains of a sudden, and these brought on efforts of expulsion: so that within half an hour's time it was already prominent, and could be laid hold of with the fingers and taken out: no inconvenience whatever, as the patient herself, who had related all these circumstances, affirm'd, being left behind.

Yet the foramen, although it transmits the urine, does not always prevent the uneasy symptoms; as it certainly did not prevent them, in the case of a light and round stone; and one of the same weight with that of Loffius; in a merchant whose history (which is altogether worthy of being transfer'd into

(*n*) Ibid. §. 5. & 7. & sect. 24. obs. 9.

(*o*) Litotom. c. 4.

(*p*) Tab. 3. fig. 9.

(*q*) Advers. 3. Animad. 41.

the Sepulchretum) Charles Patin (*r*) took care should be publish'd, almost at the same time, both at Padua, and Noremberg.

And left you should suppose this to have happen'd, because the canal was not hollow'd out in the middle, but through the anterior part of the stone; first turn to the account of that very great stone, in the *Acta Eruditorum Lipsiensia* (*s*), from which, "besides a certain heavy pain in the inguinal region, the old man, though eighty years of age, had scarcely perceiv'd any disorder; as the urine, which was carried to the bladder, flow'd through a canal, form'd on the surface of the stone, from the ureters immediately to the cervix of the bladder."

And, on the other hand, see in the acts of the Cæsarean Academy (*t*), what another patient suffer'd; notwithstanding on the surface of the calculus, which stuck in the neck of the bladder, "certain sinusses were hollow'd out," that "the urine had kept open, like natural passages," through which to discharge itself.

And indeed, that you may not ascribe so great an efficacy to the passage left through the middle of the calculi; read, in Contulus (*u*), the dissection of the Cardinal Franzosi, who, by a very regular method of living, was preserv'd almost for the space of thirty years, so as to reach his eighty-sixth year: but "many times was he troubled with calculous, and urinary disorders;" although the calculi of the bladder "represented a circle, when combin'd together:" that is left a chink in the midst of them, as the figure shows, "through which the urine pass'd down."

Then, finally, attend to what I heard from Vallisneri. There was a gentleman at Padua, of the noble family of Mantua, an intimate acquaintance of Vallisneri's, who had been troubled with most of the symptoms, of the disease I am speaking of, to such a degree, and for so long a time; that if, besides these symptoms, any impediment to the discharge of the urine had at any time come on, every physician would have agreed in their opinion of his case; and pronounc'd that he was afflicted with a stone of the bladder.

But many were of a different opinion, for this reason, that he always discharg'd his urine without any difficulty, even when in a standing posture. His bladder being examin'd after death; as he had order'd when living; in it were found three smooth calculi, of a roundish figure; and for this very reason, leaving a triangular foramen between their sides, when plac'd near to each other: wherefore, although the urine pass'd through the middle, and the calculi were of such a figure, and such a smoothness, as I see made use of to account for other patients not being troubled with disagreeable symptoms of a calculus; yet in this gentleman, certainly, they were the cause of many and very considerable inconveniencies; as they were also to the merchant of Patinus.

But these cases which I have refer'd to since those two first of Tulpus, and Nasus, I have mention'd only for the sake of comparison: because, whether they were, or were not, attended with any uneasiness to the patient, in almost

(*r*) Vid. in Lyceo Patav. ejus Vitam. & Eph. n. c. dec. 2. a. i. obs. 19.

(*s*) A. 1685. Tab. 5.

(*t*) Tom. 4. obs. 49.

(*u*) De Lapid. c. 23. & in calce libri.

all of these the calculi could be perceiv'd nevertheless, upon the introduction of the catheter; but not in the two first: as they were not obvious, but hidden in a diverticulum of the bladder, which was form'd upon the sides of it: of the origin of which diverticulum I shall have a better opportunity of speaking below (*).

But it is sufficient to have hinted at it here; that you may, even from hence, understand what deceptions may arise to patients themselves, and to lithotomists; if the calculi, which were before in the bladder, happen to recede into a sacculus of that kind, from whence they may, according to the various position, and motion, of the patient, return back again into the bladder.

For it will happen, not only that out of many lithotomists, one may perceive the stone, and another may not; but that the same lithotomist may perceive it at one time, and not at another: and the patient, who before complain'd of a tenesmus, from the weight of the stone forcing against the rectum that lies beneath it, like a quantity of harden'd excrement; and who felt, at the time when the bladder constricted itself, in order to discharge the urine, great pains from the roughness of the stone irritating the bladder; and from thence, likewise, a troublesome obstruction, which oppos'd itself to the course of the urine; will, when the stone has been diverted into a lateral sacculus of the bladder, seem now to himself to be quite free from all these symptoms and every thing else of the kind: and even quite releas'd from the disease.

But of calculi more hereafter. For if I am to go on from hence, to subjoin my observations, in the same order that I have related those of Valsalva; I must, of course, begin with that which relates to the dysuria, when brought on by a disorder of the kidneys in particular: of which kind is that I promis'd you in the latter part of the former letter (y).

11. A man of sixty years of age, had lain for some months, in this hospital, on account of a ferous infarction of the thigh, and left knee: nor did he return home after this tumour was discuss'd; being detain'd, at first, with a dysentery, and after this with a slight inflammation of one eye: and finally, when this reason, for his stay, was remov'd also, he nevertheless still remain'd on account of his indigence; which was so much the greater because he was a great eater, so as not to be content with the food given to persons on their recovery, but to be perpetually asking for more.

This man was therefore carried off, in the hospital, as he was eating, by a very sudden death; there being not the least sign of any syncope, or suffocation. Nor had he in his long stay in the hospital, ever given the least sign of the thorax, or brain, being never so slightly affected: and all I heard when I inquir'd from the persons who had been about him, was that he had been sometimes heard to complain of a sharpness of urine.

And as I found the origin of this acrimony so much the more evident in the body after death, than I did the cause of that sudden death which was obscure; I for that reason thought proper to relate, in this place, rather than in any other, what appearances presented themselves to me, about the sixth day

after death: for it was not in my power to make any observation on them sooner, for reasons that there is no necessity of hinting at here: yet the body was so well preserv'd, by means of the cold, (for it was now the middle of December in the year 1749) that although the intestines and mesentery were taken out, the day before I went to examine the body, they not only show'd no disorder at all, but even did not smell strongly. What other appearances I met with, take as they follow; beginning first with the head.

The left hemisphere of the brain, not only had many of the trunks of those vessels, which creep through the dura mater, turgid with blood, but also show'd, in the ventricle that lay beneath it, a water somewhat turbid; not in any great quantity indeed, but in much greater quantity than in the right: in both ventricles, the plexus choroides were pale. And although the medullary substance of the cerebrum was somewhat hard, yet the cerebellum was very lax.

In the thorax, the posterior surface of the left lobe of the lungs coher'd closely with the pleura: and the edges, both of this, and the right lobe, show'd their vesicles to be distended with air, to a considerable extent. However, neither the aspera arteria, nor the larynx (which were also examin'd internally) had any mark of disorder: nor yet the great vessels, nor the heart itself; in which was nothing polypous. Within the pericardium was a turbid water; but in no great quantity: and in both the cavities of the thorax, as in the belly also, was so small a quantity, that it did not exceed, in all, more than a few ounces.

Finally, the belly when open'd; if you except some of the genital parts, particularly the urinary passages, and a few of the arteries; show'd all its contain'd viscera to be nearly in a natural condition: nearly, I say, for the liver, and the stomach, which was half-full of ingesta, partly solid and partly fluid, appear'd somewhat larger than they generally do.

But the trunk of the great artery, where it lay on the vertebræ of the loins, had, in some places, white beginnings of ossification, which the ramifications of it also had: and indeed it had true bone already form'd; as I found in that part, in particular, where the right iliac divided itself into two branches.

As to what relates to the genital parts, the right testicle was three times larger than the left. But this was perhaps natural; for both of them, when cut into, were found to be sound. This appearance, however, was from disease; I mean that from the tunica albuginea of both of them, and from the same part in both, hung a somewhat round and very small body; which, although the coat itself was white, was of a redish colour; the remains, I suppose, of a foregoing hydatid: yet there was no water within the tunica vaginalis.

At length the internal structure of both kidneys appear'd to be confus'd: nor were small cells wanting, full of fluid, one of which; for the others lay hid somewhat more internally; show'd itself partly on the surface. Each pelvis, after it had descended from the kidney, in a preternatural state of distention; so as to be equal, in width, to two inches; contracted itself into the ureter. And the ureters, when they had run almost half their length, became wider than they generally are; and particularly the left, which was also increas'd in its length, by reason of its flexures.

In both of them, you would suppose, if you handled them externally, that calculi were contain'd in some places, though only here and there. But when we came to open them, we found, in every one of these places, an hydatid; some of them round, others oval; hanging from the internal coat into the cavity of the ureter, and yet not by a small stalk. The round ones were equal in size to small grapes; and the oval ones were twice as large as they longitudinally.

The ureters consisted of pretty thick coats, the internal of which was ting'd with a continual redness: and they open'd by more oblong orifices than was natural, into the bladder. This reservoir contain'd so great a quantity of urine, that in the supine posture of the body, it extended itself to the lowest vertebræ of the loins. And indeed when, after the urine was squeez'd out, it was distended with air blown in; although it came near to that shape which was mention'd, by me, in a former work (*z*); it was nevertheless considerably longer than it generally is: however, the coats thereof were not thicken'd, nor were internally red in any part; with which colour not even the urethra was ting'd.

Finally, that which I promis'd in the preceding letter (*a*), ought not to be omitted. From the posterior border of that orifice, from whence the urethra begins, two white, hard, hemispherical, prominences, small in their size, but of equal magnitude, and contiguous to each other, protuberated within the bladder; in cutting which longitudinally, together with the prostate gland, I found them to be continu'd thereto, and to be made up of the same substance: and although one part of the prostate gland was not of that whiteness and hardness; yet the remaining substance thereof, and especially that which rose up on the sides of the feminal caruncle, was perfectly like that of the double prominence, into which it was produc'd; so that if these prominences were scirrhus, the largest part of the prostate might seem to be no less scirrhus also.

12. The other appearances that I demonstrated in the brain, the heart, and the other viscera of the same body, which were accurately dissected, do not relate to the present subject, nor are proper for the present occasion; because they were not preternatural.

And this being the state of matters, I could not suppose the cause, of so sudden a death, to have consisted in any thing else, but a certain very violent convulsion of the pia mater; and this in consequence of the serum; which a long stagnation in the thigh had, perhaps, render'd very acrid; not being sufficiently carried off by stool; and having, therefore, fallen, at last, upon the membranes of the brain, to the utter destruction of the patient.

But the complaints of the acrimony of the urine, had been of much longer standing, in my opinion, than the infarction of the thigh: at least the origin of them will, certainly, seem to be of a very ancient date, if you consider the state of the kidneys, ureters, and bladder.

These parts had, in all probability, been formerly affected, universally, with calculi: that is to say, the kidneys, by their formation, and increase; the ureters, and bladder, by their various delay in these parts; which, by sym-

(*z*) Epist. anat. 1. n. 61.

(*a*) N. 19.

pathy, again injur'd the kidnies, the pelves, and the other parts just now mention'd: the greater part of them being enlarg'd, by the retention of urine; and the ureters, moreover, being injur'd in a peculiar manner; so as I do not remember to have seen them in any other subject; I mean by having internal hydatids brought on them, which, even of themselves, might have retarded the urine, and, without any calculi, have been the cause of the greater part of those symptoms which I just now accounted for from calculi; or, to say the least, might have increas'd every symptom that the calculi gave origin to.

But whatever was the cause that brought on these diseas'd appearances, it certainly is not surprizing, that an urine more acrid than usual, should have distill'd from kidnies of this kind: or that, from the glands of ureters of this kind; instead of a humour fit to smear over and defend them against the saline particles of the urine; an acrid humour, or none at all, should be secreted.

For, from either of those causes, you may account for these passages being internally red, instead of having their natural whiteness; and sending down to the bladder urine that either was become more acrid than usual within themselves, or was at least untemper'd with that addition of an emollient and demulcent nature.

And what I have touch'd upon but slightly here, you will the more approve of, if you read those writings of our friends Pujati and Benevoli; and transfer hither what I have pointed out in the preceding letter (*b*). For I must now go on, in pursuance of the order I profess'd to observe, to that dysuria which is from calculi of the bladder.

13. Andrew Cortini; a fellow-citizen of mine, father of the very reverend inquisitor of that name at Ferrara, and the grandfather of Anthony Cortini, who is very expert in the chirurgical and pharmaceutical art, and one for whom I have a great regard; being of a fattish habit of body, and but little us'd to exercise, began, after he had advanc'd beyond sixty years of age, to make water of a white colour, and of a viscid nature.

From hence arose a suspicion that he had a calculus in his bladder; which suspicion the surgeon, by introducing the catheter, confirm'd himself in, but not the patient: for when the surgeon said he touch'd the calculus with the catheter, he, on the other hand, being deceiv'd by the impulse of the calculus, asserted that it was not a calculus he touch'd, but the bladder. And this opinion he was the more confirm'd in, because, from the time of introducing the catheter, he had found it much easier to discharge his urine.

Now therefore he did not complain of this so much, as of a certain pain in the scrobiculus cordis, which, if he walk'd a little more quick than usual, oblig'd him to stop. To this was added turgid and vibrating pulsations of the arteries; such as frequently happen from an aneurism. Nor indeed did these cease, when, after a long interval of time, the difficulty of making water return'd, with a sense of heat about the pubes. And indeed the complaints of that pain in the scrobiculus cordis, were almost continual: the pulse continu'd the same.

Three or four years had pass'd from the first beginning of the dysuria; and from the beginning of the other disagreeable symptoms, at least two and twenty months, when I was also call'd to the patient, before the end of February, in the year 1711, to comfort him, as I immediately said to his domestics, rather than to cure him.

He made a much greater quantity of water than he drank: and his urine was of a yellowish colour, inclining to white; like the whey wherewith a portion of milk still remains mix'd; a white matter afterwards subsiding; sometimes in small quantity and thin, at other times in large quantity and thick; and of an ill smell: and this was discharg'd with a greater degree of pain and difficulty; as was wont to happen, chiefly, about the morning.

The pain in the scrobiculus cordis was become so very violent, that the patient said, when it attack'd him the most severely, as it did at intervals, that it seem'd to him just as if he were torn by dogs: at which time he also said that the sternum, and the neighbouring parts, on both sides, were painful; but that the upper limb, on the left side, became stupid, and without sensation: and finally, that the heart, especially if he lay on the left side, palpitated to a very troublesome degree.

These symptoms became more violent every day, so that the face was no longer red, in those exacerbations of pain, as it before us'd to be in general; and even the nose, hands, and feet, were cold: and the intestines, which it had been hitherto necessary to relax every third day, by means of a clyster, now discharg'd a bilious matter after each of these exacerbations.

But, lest any one should suspect that these arose from an irritation of the bladder; in proportion as these were more heighten'd and severe, so much the more slight was every symptom about the bladder; and the urine was discharg'd with the more ease. Yet you did not, on applying your hand to the breast, or the belly, perceive any thing that was preternatural: and even the belly had no where any hardness, nor the least tension whatever.

In the mean while, his sleep being broken with his pains, his appetite for food being deprav'd, and a thirst troubling him, his strength was more and more worn out: the internal senses began to be torpid as it were; and the pulse itself had so declin'd from that first magnitude, and impetus, as to become small and weak (especially on the left side) and frequently unequal, and this also particularly on the left side: but in the last exacerbations there was no pulse at all perceiv'd.

In this deplorable state of things then, I did not omit to give all the ease in my power, though I could do nothing by way of radically curing the disorders. But all the remedies I could try, though they had no bad effects, had no good ones nevertheless. On the eighth of March therefore, two or three drops of blood having fallen from his nostrils spontaneously; and he having spent the following night worse than ever, from the frequent attacks of pain in the scrobiculus cordis; and having, nevertheless, rais'd himself to sit up in bed in the morning, when the pain was gone off; the same pain return'd about an hour after: and raging very violently carried off the unhappy patient, I had almost said, suddenly.

The thorax of this body, which was, even then, furnish'd with a pretty large quantity of fat, being first dissected; we found the lungs, the heart, and

and the large vessels, to be quite free from disorder. The belly contain'd a liver which was not of a natural colour: the gall-bladder was contracted and flaccid; in consequence of the pains, of which I have spoken, having so many times press'd out the bile. The fundus of the stomach, which was in other respects sound, show'd a slight appearance of blackness.

The left kidney; being almost universally consum'd in its internal substance, and extremely flaccid; contain'd an unequal calculus, and urine like that which the patient had discharg'd. This kind of urine was also found in the right kidney: the external surface of which was divided into a great number of rising globules, as it were, of an unequal magnitude among themselves.

The bladder contain'd three stones, which were neither rough nor large. The internal surface of this cavity seem'd to be made up of a kind of *tomentum*, or tow, and grew out at the side of the cervix, into a hard tubercle, not larger than a bean; and of the same colour with the bladder, both internally and externally. Finally, in the prostate gland was a sinus, wherein a matter similar to tartar, and already almost calculous, was contain'd.

14. In this patient, the causes of the dysuria; which is the subject of our present letter, were contain'd in the prostate gland, the bladder, and the kidneys: but the causes of those very violent pains, whereby he was tortur'd to such a degree, and at length destroy'd, lay, as far as I can conceive of the case, in the kidneys. For it is not probable that these pains were excited from the lower parts of the belly; especially as there were very great disorders in the kidneys, with which no body can be ignorant to what a great degree the stomach consents, the right side of which answers to the *scrobiculus cordis*.

And to this consent are we to impute the vomitings that are, generally, join'd with disorders of the kidneys. You will therefore remember that, in a very obscure case (*c*), I suspected these disorders to exist from the actual existence of these vomitings.

There had also been very great vomitings, in a virgin, who was kill'd within the space of two days, by an excruciating pain under the left ribs; owing to an occult disorder of the kidney, as I have describ'd in the thirty-sixth letter (*d*). Yet it has sometimes happen'd, that considerable disorders of the kidneys have lain hid (*e*), without any vomiting, and without any, or, at least, with very slight marks, of the kidneys being diseas'd; or that they have impos'd upon physicians, for disorders of the bladder, which was entirely unaffected (*f*).

Finally, it is certain, that with disorders of the kidneys, a pain of the stomach is sometimes join'd; but not one that is mortal, or disjoint'd from a pain of the loins; which every one knows to attend, in general, upon disorders of the kidneys, that are affix'd thereto: and these either not severe, or sometimes violent, as I have related in another letter (*g*) from Ruysch, when he saw the surface of the kidneys divided into globules, just as I observ'd it to be in the right kidney of this patient.

However, in this case of ours there was no complaint of the loins; no very severe pain in the bladder; no excruciating tortures of the hypochondria;

(*c*) Epist. 30. n. 22.

(*d*) N. 20.

(*e*) Epist. 40. n. 15.

(*f*) Vid. supra, n. 4 & 5.

(*g*) Epist. 40. n. 19.

no vomitings; but intolerable pains at the scrobiculus cordis, were the only signs of the kidneys being affected with disease.

You will perhaps ask, whether this circumstance has been observ'd by other authors: it certainly so much the more deserves to be notic'd, as it may the more cause a suspicion of other diseases; especially if, as in the history propos'd, it follow after large and vibrating pulses; and bring on the troublesome palpitation of the heart, a stupor, and torpor, of the upper limbs, and at length death itself: and that even almost suddenly, when the patient seems to be somewhat refresh'd.

For I have already admonish'd (*b*), that this is to be fear'd, when violent internal convulsions recur at intervals. To which kind of disorder, I suppose the exacerbations of pain I have describ'd to belong: and I account for them from the very great irritation of the nerves in the kidneys; so that being propagated by means of the other nerves communicating therewith, to those parts which I just now mention'd, it produces, in each of these parts, the effects I have spoken of.

This singular circumstance attended our case, that the stomach, which is, as I have already taken notice, generally attack'd by exacerbations, proceeding from the kidneys, was not, as usually happens, excited to vomiting; notwithstanding that part of it, which answers to the scrobiculus cordis, was very severely tortur'd.

15. A young man, who had pass'd his twentieth year, had been tortur'd, for a long time, with such pains of the bladder, especially when he made water, that he could not discharge his urine without crying out. His urine was purulent. An emaciated state of body, a fever, and other disorders, which generally accompany a stone of the bladder, had come on; and by these he was, at length, carried off in this hospital, before the end of the year 1742.

The bladder, which was thicken'd in its coats, ulcerated, and, in part, scirrhus, actually contain'd a stone which was somewhat rough on the outside, and three inches in length; being two inches and a half broad, in the broadest part of it: it was also nearly of an oval figure, and depress'd on both sides; and in some places a great quantity of tough and bloody mucus adher'd round about it. The kidneys, and the ureters, were full of pus, and urine; and the ureters were even distended to such a degree, as to equal the diameter of the intestinum ileum.

16. The mucus, which we saw adhering to the calculus of this young man, is sometimes gather'd around it in so great a quantity, that the stone cannot be distinguish'd, even by introducing the catheter; a circumstance which happens to the most experienc'd men; and which, as Marcellus Donatus testifies (*i*), happen'd to Fallopius himself.

By this mucus, when gather'd round the calculus, betwixt that and the bladder; though it does not tend to remove the other symptoms, and even increases some; the pains, nevertheless, which are created by the roughness of the calculi, are diminish'd: and particularly if the mucus is very thick, and in great quantity.

(*b*) Epist. 10. n. 13.

(*i*) De Med. Hist. Mirab. l. 4. c. 30.

Hence it is that the pains are increas'd by diuretic medicines (which I said also of nephritic cases) as our Sanctorius confirm'd by a very clear example, that is transfer'd into the Sepulchretum, in the preceding twenty-third section (k); where you will also read that of Donatus (l).

Wherefore, in opinions which I have read, Valsalva prescrib'd, in cases of stone in the bladder, demulcents, emollients and anodynes; and applied them in the form of fomentations, steams, and small glysters; and to women even in pessaries and injections: but as he, in conjunction with Albertini, disapprov'd of narcotics; because they did not act with any advantage, in very small doses, against pains of this kind, and very large doses were dangerous: so also they disapprov'd of the drinking of bath-waters, or any other waters in large quantity; which has been propos'd by others; fearing lest the mucus we have spoken of should be wash'd away. On which subjects I remember to have heard them both speak, many times, to the same purpose; but particularly when the master of the horse drank the water of Nocera, in pretty large quantity, every morning.

That this gentleman had an ulcer in his bladder, no body doubted, and Valsalva still less than others; as he did not believe it was always necessary that blood should have appear'd in the urine, in order to induce him to pronounce that there was an ulcer in the urinary passages. One thing however was a matter of controversy; I mean whether, besides an ulcer, there was a calculus in the bladder. This was affirm'd by some, on account of the pain which had already been long perceiv'd in the end of making water.

But Valsalva and Albertini withheld their assent; well knowing that an ulcerated bladder could not, more than an ulcerated hand, be contracted, and constring'd, without pain: and this they knew to be the reason why the bladder, when thus ulcerated, like other hollow parts, which are under a necessity of being dilated at one time, and contracted at another, are with great difficulty brought back to a sound state.

Yet they did not contend that no calculus was in the bladder; although the patient, either in dancing, or riding in a coach, experienc'd no symptoms of it; nor yet, while he discharg'd his urine, perceiv'd a very severe pain at the end; but such a one as he again began to perceive, when he had at length discharg'd as much as he had drunk.

However, although they neither affirm'd, nor denied one or the other, yet Albertini seem'd to me, in some measure, inclin'd to believe that there was no calculus; since, by so plentiful a drinking of water, the mucus must have been taken away from the stone, and the troublesome symptoms, consequently, daily increas'd by this means: and, on the other hand, he conceiv'd that while the water was passing, the ulcer and pains might be mollified, and asswag'd thereby; and that these pains did not return to their former severity, before the urine began to recover its former acrimony, after the discharge of all the water.

But lest you should think this hesitation in affirming, or denying, the existence of a stone in the bladder, was too cautious in such men as these; or those of equal eminence with themselves; I beg of you to read what has been

(k) Obs. 4. §. 11.

(l) Ibid. §. 4.

excellently well collected, and consider'd, by Helwich (*m*), among others, of the very great difficulty of properly determining such a question: the more you shall be displeas'd by the head-long rashness of some others, the more will you commend the prudent cautiousness of these gentlemen.

17. That I do not here add other dissections, of those persons in whom a stone has been form'd in the bladder, without any external cause, will not be surprizing to you; as you know, that the greatest part of my life has been spent in this country, that is, like some others; among which those of Schafhausen (*n*), and Gottingen (*o*), are commended; very little liable to that disorder: and this circumstance some think is owing to the wines, some to the waters, and others to both of them.

Certainly, the wines in this place are not tartareous, to speak in the language of physicians: that is to say, they do not cover over the casks, internally, with stony crusts; as I have seen in some other places where they make white wines: so that a cask of stone seem'd to have been form'd within the wooden cask.

But the wines that we make use of here are red: which wines Brunnerus (*p*), indeed, thought "affected the head, and the upper parts, more than the white;" yet, on the other hand, his father-in-law, Wepfer (*q*), whose opinion is commended by Hoffmann (*r*), ascrib'd it chiefly to the salutary effects of their red wine, that calculous disorders were very rare among his fellow-inhabitants of Schafhausen.

And that red wines are produc'd, in some places, which not only preserve from the stone, but even dissolve it when begun; inasmuch as they even dissolve the tartar, wherewith other wines have incrusted the cask, into which they are put; you will learn from the *Commercium Litterarium* (*s*).

Moreover, in regard to the waters; the water of the rivers in this country; with an equal part, or somewhat more, and even sometimes a much larger quantity, of which the must (from whence the wines generally us'd in this country are made) is preserv'd; contains, perhaps, less earth, as is generally said; or at least less of the matter fit for the generation of calculi.

And I speak thus generally, because it is necessary to attend to a great number of different circumstances, and make many minute examinations, before any thing certain be pronounc'd of every one river in particular: although, for the most part, less earth is found to be contain'd in river-water, than in well-water; from whence it happens that we see the former fit for many domestic purposes, for which the others are not, or at least not equally; as, for instance, that of dissolving soap, and boiling beans or peas: and as to the question of wholesomeness, who can doubt but that the water of rivers, and fountains; which the will of almighty God has caus'd to offer themselves spontaneously to us for drink; are, in general, more salubrious than those waters, which necessity has oblig'd men, who live at a distance from rivers, and springs, to procure for themselves, by digging deep pits in the earth?

(*m*) Act. n. c. tom. 2. obs. 60.

(*n*) Vid. Eph. n. c. dec. 1. a. 2. obs. 39.

(*o*) Vid. Haller. Opusc. Pathol. obs. 33.

(*p*) Eph. cit. cent. 9. obs. 3. in not.

(*q*) Obs. 39. paulo ante cit.

(*r*) Med. Rat. tom. 4. p. 2. f. 2. c. 11. §. 20.

(*s*) A. 1735. hebd. 6. n. 3. & hebd. 17. n. 4. & prefat. in not. ad pag. 43. & 132.

And if the opinion of the most learned men is also to be attended to, see what Mead (*t*), and Platner (*u*), think of well-waters: if you suffer yourself to be persuaded by their judgment, which is certainly supported by many different reasons, you will not hesitate greatly to prefer river-waters to those of wells; speaking of them in general.

But if the question be of particular waters; there certainly are rivers to which you would prefer a very good well; and still more another river. For you know, that the waters of certain fountains, from whence rivers, at length, have their origin, are those that incrust their canals, some with very thick and hard earthy laminæ, and others with thin and softer laminæ.

And these few things I have hinted at here, that you may refute the vulgar error of those who imagine that all calculi are owing to the custom of drinking wine, or such like liquors: as if there were not, even in water, a matter of that kind; and they who had never drunk wine never generated calculi. At least he who is spoken of in the preceding twenty-third section of the Sepulchretum (*x*), “had made use of water-drinking only, through the whole “course of his life; yet his “bladder contain’d two and thirty stones.”

But why do we inquire after examples of this fact in human creatures; since many of the like kind are to be met with in animals who never drink wine. For to omit the more specious examples; either on account of their weight; as that stone, for instance, which weigh’d almost two pounds, and which being taken from the bladder of a man, Lemery brought to the Royal Academy of Sciences at Paris (*y*); or on account of their colour; as seven or eight very small ones which Vallalva formerly show’d me, and which were taken from the bladder of a cow, having the form of pills, and being of a surface that was rough with very small granules, and of a brassy colour; so that any who did not know them to be light, would have taken them for metallic bodies, as he would have done for golden ones, those greater numbers of calculi, that were ting’d, both internally and externally, with a golden colour, and all of them small, which others (*z*), in like manner, found in the bladders of oxen; to omit those therefore, and those found in a sow (*a*), and others, and to take notice of them only in dogs; and, in the first place, those seen by me in a bitch, that I dissected when I was a very young man, for the sake of exercising myself in anatomy; I not only found calculi in both kidneys, but I also found that the right kidney did not retain even a third part of its substance: whereas there was a purulent matter among the calculi.

And in another bitch, of a considerable age, that I formerly open’d at Padua, for the sake of experiment, I found a calculus, within one of the kidneys, of an irregular and depress’d figure; hard in its substance, and not small in its size. And to return to the bladder; the third bitch (for it accidentally happen’d that these five creatures, the calculi of each of which I have mention’d in particular, were all of the female sex) had two stones in its gan-

(*t*) Expof. Mechan. Venen. tent. 6. in fin. marolog. c. 14. §. 8. vid. & apud Haller. ad

(*u*) Progr. quo aquam font. falubrior. & Boerh. Meth. Stud. Med. p. 13. c. 2. ad an. 1665. n. 101.

(*x*) Obf. 4. §. 2.

(*y*) Hist. a. 1700. obf. anat. 14.

(*z*) Act. n. c. tom. 8. obf. 2. & Sachs Gam-

(*a*) Sachs c. cit. 14. §. 6. & eph. n. c. cent. 7. obf. 7.

grenous bladder; a larger and a smaller; both of them of an oval figure, but very much depress'd on both sides: and even one surface of the lesser was somewhat excavated so as to receive the larger.

This bitch was eleven years of age, and had, for a long time, discharg'd a very ill-smelling urine; yet without howlings, I suppose on account of the smooth surface of the calculi, which, for that reason, did not prick the bladder at least; till, at length, she was carried off by convulsive motions, where-with she had been seiz'd. This relation I receiv'd from the master of the dog (who was one of the philosophers of this sacred college) at the same time that he show'd me the recent calculi.

And calculi have been met with in so great a number of dogs, by others, that unless I select those only, which, either their number, their structure, weight, or situation, make more worthy of being notic'd; I shall not soon come to a conclusion. In a dog, which had long labour'd under a dripping of urine (*b*), "some thousands" of small calculi were found "in the distended bladder." The bladder of another (*c*) contain'd one, which, by reason of a lesser that was included within it, resembled an *ætiles*, and was a pound and a half in weight.

But the bladder of a third (*d*); which often discharg'd its urine with pains, and a vehement howling; contain'd a calculus of a rough surface; and not smooth as in the bitch I open'd at Padua; and although it was somewhat less in weight than three ounces, yet you will wonder more at this than at that which weigh'd a pound and half: for this dog was very small in its species.

Finally, to describe the situation, rather than the calculus; that ought not to be pass'd by, which a worthy young gentleman, who was a pupil of mine, told me, some years ago, he had found in a dog which he dissected for the sake of exercising himself in anatomy. The ureters, a little above the place where they open into the bladder, both of them join'd together into one canal; which was not wider than either of them when separate: this one canal, which is a very extraordinary instance, perforated the bladder in the middle of it, and at the lower part; and thus serv'd instead of the two ureters, which usually carry the urine into this cavity.

At the beginning, then, of this canal; where the ureters, as I have already said, join'd together; he found a calculus sticking, which was not very hard. Yet all these examples, and much more the other instances which Donatus (*e*) has collected; of calculi found in the liver also, or the gall-bladder, as well as in the stomach, and intestines, of brute animals; are not to be objected, in the manner Donatus has done, to Aristotle; when he says (*f*) "that no animal but man can become calculous;" for he has immediately explain'd this, in such a manner as to show plainly, that he meant to speak there only of calculi in the urinary bladder.

And in another passage (*g*), which it is surprizing should escape Donatus, he has expressly said, that, in victims, "the kidnies" were seen "very fre-

(*b*) Earund. dec. 3. a. 5 & 6. obs. 260.

(*c*) Ibid. in append. sub n. 6. ad obs. 23.

(*d*) Dec. ead. a. 9 & 10. obs. 170.

(*e*) C. cit. supra ad n. 16.

(*f*) Sect. 10. probl. 42.

(*g*) De Partib. Animal. l. 3. c. 4.

“quently to be fill’d with calculi, with lacerated membranes and tubercles, and even the liver and other parts.

18. And from what Aristotle has said in another place (*b*); “that not only a humour descends into the bladder, but some dry concretions also, from which calculi may be form’d;” we understand the most ancient origin of the opinion of those, who asserted that the beginnings of all calculi, of the bladder, come from the kidneys; and that in these calculi, for that reason, a peculiar nucleus is always found in the center.

And although I do not deny but both of these circumstances are true in many persons, yet I shall sometimes be more ready to join with the opinion of Hippocrates (*i*), who has taught us that this happens from the urine being very long confin’d; whereby that which is the most thin part of it, is discharg’d: “but that which is most thick, and turbid, is heap’d up together, and concretes; and at first, indeed, is small, but afterwards becomes larger: for while it is roll’d about by the urine, whatever is thick and compacted together, adapts itself thereto, and by this means increases it, and forms one general concretion.”

And that this may happen very soon, appears from the observation of Joannes Dolæus (*k*), who asserts that a white mucilaginous matter, discharg’d from the bladder of a certain knight, “had been suddenly harden’d into a yellowish calculus; from being expos’d to the external air.”

But that the urine, by stagnating within, may become putrid, even without the contact of the external air, appears from the experiments of the celebrated Brendelius (*l*); who deduces, from the putrefaction thereof, the origin of calculi: as he sees (*m*) that it produces both hard crusts, and a mucous pultaceous matter, distinguish’d with hardish granules; which itself also grows hard soon after.

And that there are urines which deposit these particles sooner, and more readily, he does not at all doubt (*n*), where he mentions the cases of two infants; one but just two days old, and the other about eight; who not only discharg’d calculi before death, but had calculi found within them when dead.

And what kind of calculous matter Mead saw (*o*), in the carcase of a boy of five years old, and by what degrees he observ’d it degenerate into a stony hardness, you may learn from himself: as you may also, from the celebrated Haller (*p*), what he supposes to be the first beginnings of calculi in the kidneys.

But whether the incipient calculus, or the matter of the calculus, descend from the kidneys into the bladder, or be generated in the bladder itself; there is no doubt but the calculus has its increase from the same matter: nor do they seem to advance any thing contradictory to truth, who say that the particles of this matter will be more firmly adapted to each other, in proportion as the increase is more slow; and less firmly, in proportion as the increase is more speedy: and they seem to be nearly in the right, who

(*b*) Hist. Animal. l. 3. c. 15.

(*i*) De Aere, Aquis &c. n. 22. 23.

(*k*) Eph. n. c. dec. 3. a. 4. obs. 64.

(*l*) Progr. de calculi vesicæ & cat. Natalib.

(*m*) N. 1.

(*n*) N. 2.

(*o*) De Imp. Sol. & Lun. c. 2.

(*p*) Opus. Pathol. obs. 34.

suppose that this increase will be greater in summer, than in winter; as in summer the calculus matter is much less diluted by the watry matter, which then goes off, through the skin, in a very considerable portion: and this seems to me another reason why, if it is in our power to choose, the excision of the calculus should be put off from autumn to spring, rather than from spring to autumn.

Yet besides the beginning of the calculus, form'd either in the kidneys, or in the bladder, the same matter adheres round about other things also, that are introduc'd into the bladder from without. But as many examples of this kind have been written and collected by many authors, I shall insist chiefly on those which I myself, or my friends have seen; and yet shall not describe them all nevertheless.

19. For the first that offer'd itself to me, is that which was publish'd three and forty years ago, in the *Ephemerides Casareae N. C. Academicæ* (q). And indeed, besides that of mine, another description is also extant of the very same case; by one who did not know that mine was publish'd: this second description was publish'd sixteen years after, in a certain annotation join'd to the works of the celebrated Vallisneri (r); who had been present, together with me, while the surgeon perform'd the dissection.

Both the descriptions, indeed, agree pretty well together in the principal matters: and if they differ a little in some things, consider that I certainly committed my observations to writing on the very day of the dissection, as my custom is. And the calculus, which I still preserve by me; together with the needle about which it had been accreted; is certainly not "very hard:" and this the magnitude of it, compar'd with the weight, at first sight testifies.

For although it consists of two parts, each of which approaches to the oval figure; and the larger part, within which the point of the needle; and almost a third part of it, as it is natural to suppose; lies hid, is three inches long, two broad, and one and a half thick: and the lesser part, which fill'd the urethra, in the same manner as you will read in the case of another virgin (s), is continued to one extremity of the former part of the calculus, in such a manner, as to shoot out at the side of it, and form a right angle therewith, and equal the third joint of the middle finger in magnitude; yet both of them, together with the needle, are below the weight of a phillippic silver coin.

And that the substance of the calculus is, in great measure, friable (or at least, externally) and its texture spongy, is confirm'd even by looking at it. For certain thin lamellæ have fallen off, in some places, spontaneously, and have laid open the small caverns that lie beneath: and a pulveriz'd matter, of a white colour like the calculus, similar to that which falls from rotten willow or withy branches, naturally moulders from the stone.

And this I was willing to add to the description at present, as a circumstance that I could not observe in the recent calculus; and indeed not till it had lain by some time.

This calculus is, therefore, furnish'd with such *cortices*, or shells, as, if

(q) Cent. 5. obs. 26.

(r) Tom. 3. p. 3. Off. 12.

(s) Sepulchret. sect. hac 25. obs. 5.

there had been other harder stones in the bladder, at the same time, might easily have been broken by the dashing of these against them; and being shatter'd into fragments come forth, with the urine, by the same passage: as happen'd in the old man, whose history is given in the Sepulchretum (*t*), from the observation of Tulpus.

Nor will you suppose the calculus to have been of a much harder nature, which that very experienc'd man Heister (*u*), having previously perceiv'd it by the help of the catheter, soon after, by means of some common remedies, that he subjoins, got rid of: for by the use of these medicines, a great quantity of matter, in the form of a calx, was discharg'd with the urine; and within three weeks, all the disagreeable symptoms, wherewith he had been troubled for the space of four years, were remov'd: and this case he gave the relation of, when it was now the third year after that successful cure. And I could wish that all the calculi, which are form'd within the bladder, were of that kind.

But you see from the Sepulchretum itself, how many are said to have been of a flinty hardness: you even see, in the same place (*x*), that a very large one is spoken of, from Heers, as being "harder than any flint;" and from Bravolus (*y*) ten, that were found in Albertus Savonarola, which, if they were thrown upon the ground, rebounded like a ball: and finally, you will find in Linden (*z*), that one which can be exceeded by very few in point of weight, was seen by many persons; that is to say, one which weigh'd thirty-two ounces, and was "very hard, compact, triangular, and of the colour of" "a flint: and from hence, by means of steel, fire was drawn as from a flint."

And Panarolus, in like manner, speaks of calculi (*a*), which were "so hard" "as to resemble the lapis pyrites; for when stricken with steel, they discharg'd fire:" but these I purposely omit to take notice of, lest, as he says they were discharg'd by a woman, you should suspect that he was impos'd upon; since Bartholin (*b*) says that many had conjectur'd a noble patient, and his friends, who were present, to have been impos'd upon, even in lithotomy itself, by a crafty juggler; because sparks of fire were struck out of the false stone; "and it is impossible that such a stone should be generated in" "a man;" for which reason he could scarcely forbear doubting the history of another of like hardness, which had been given to him, as having been cut out of the human bladder.

But all those that I have taken notice of, from the Sepulchretum, are said to have been found in the bladder of bodies after death: and lest you should doubt whether there had been any cause of fraud, the first, at least, was found in an old man, who had never complain'd of a calculus in the bladder; as another old man never had of his kidneys, who, nevertheless, had a stone in his right kidney, of an unusual magnitude, and figure; and "in hardness" "equal to any flint whatever:" as that celebrated man Christoph. Guil. Barjerus (*c*), who was present at the dissection, asserts.

(*t*) Sect. prox. 24. obs. 10.

(*u*) Dissert. de Medico nimis tim. n. 36.

(*x*) Sect. 23. obs. 7. §. 5.

(*y*) Ibid. obs. 2. §. 4.

(*z*) Ibid. obs. 1. §. 1. & sect. 24. obs. 10.

(*a*) Jatrologism. pent. 2. obs. 34.

(*b*) Cent. 4. Epist. Medic. 100.

(*c*) Commenc. Litter. a. 1745. Hebd. 40. n. 2.

To me, however, it has never yet happen'd to have a calculus shewn me, that could be compar'd with these; unless by the fraud of women, and the credulity of one or two physicians, who had been too easily deceiv'd by their artifices.

For here I first saw one, which not only; to use the words of Ferrandus (*d*); "should be call'd a river-stone, rather than a calculus of the bladder;" but, though it was really a river-stone, was daub'd over with blood, and obtruded upon the incautious for a real calculus of the bladder.

And after that I had a letter sent me from Venice, by a physician in other respects not unlearned; in which he told me of a certain woman, who discharg'd, almost every day, a great number of calculi, and those not very small neither: and, in order to gain credit from one who did not easily believe, with the letter he sent a great number of the calculi; on the sight of which I was immediately astonish'd, that there could be any one in the world, who did not know them to be large, and rough, fragments of the common flint, which is made use of to strike fire: however, I wrote back nothing else, but that I desir'd him to subject them to a chymical distillation, and the consequence thereof would show the nature of the stone; I therefore receiv'd no more letters from him.

Yet I do not say these things, as if others may not have seen, in other places, what I have not seen wherever I have been. And indeed I persuaded one of my own countrymen, who denied that a calculus could have been generated in the human body; for this reason only, that it resisted the hammer; to attend to the other properties in like manner, and make a diligent inquiry; since we see that Steinius is quoted by learned men, as having describ'd human calculi which resisted the strokes of the hammer, in his Lithographia.

And we must, beyond a doubt, give credit to the very experienc'd Morand (*e*), when he asserts that the calculi, which he calls *murales*, take the same polish as marble: for which reason he thought them unconquerable, even by that lithontriptic remedy, which had been, not very long before, made public among the English; by means whereof it has been found that several other calculi have been either diminish'd, or consum'd; and that by the testimony even of the catheter also in seven: at which Franciscus Sylvius, and Boerhaave, would have been surpriz'd, had they been living, that this could be brought about by means of alkaline salts, and even could be brought about by no other; for one of them (*f*) had said, that this might be effected "by rock salt, or the acid spirit of nitre:" and the other (*g*), that it could be "done by scarcely any other fluid than the spirit of nitre."

But I wish they could be astonish'd that the use of this English remedy had produc'd such effects in every one, or at least in the greater part, of the patients who had taken it: and, indeed, I wish that it had not been hurtful. But if you consider those great number of exceptions, which were afterwards added; among which are those, also, that the celebrated Hazonius (*b*) has

(*d*) Sepulchr. sect. cit. 23. obs. 2. §. 5.

(*e*) Mem. de l'Acad. R. des Sc. a. 1740.

(*f*) Prax. Med. l. 1. c. 55. n. 50.

(*g*) Prælect. ad Instit §. 794.

(*b*) Quest. de his Editæ n. 4.

shown us are to be taken from the nature of the calculus, from the age, and from the temperament, of the patient; it will appear pretty clearly, how often this remedy might be either useless or hurtful: and if you read the histories and dissections, which the *Commercium Litterarium* sets forth (*i*); you will easily understand, how much damage arises from thence to the internal parts, and particularly to the urinary passages: and at the same time you will find that there was no erosion of the calculus, or of the calculi, which would have appear'd from the sediments in the urine.

But while I speak this, do not suppose either that this erosion, or desquamation, of the calculi; if we consider every kind of calculi, and every kind of lithontriptics in general; is always to be desir'd. You may learn this, not to turn over other books, from the *Commercium* already quoted. And where (*k*) the examples, and the dissections, of two calculous bodies are describ'd, the calculus of the former, "which was widely and deeply eroded in several "parts," deserves to be attended to; for some lithontriptic liquor being given, to which that effect was probably to be imputed, all the symptoms had been exacerbated: and the bladder, though not eroded indeed, had been inflam'd, round the orifice, to a considerable extent.

In another place (*l*), the case of an illustrious man is taken notice of by the celebrated Goetzius: wherein he says that the patient; having, by the means of some remedy or other, discharg'd in his urine "a very large quantity of small sandy particles, and scales, which seem'd to be the shell of the calculus broken down into pieces;" had his pains increas'd to such a degree thereby, that he was carried of in consequence of the exacerbation.

And in the body after death, was found a calculus, "depriv'd of its viscous "and smooth surface (which had lain in contact with the sides of the bladder "without any injury) and forc'd, with its very hard, rough, and unequal "surface, against the neck of the bladder;" so that this change, in the stone, seems to have excited the violence of the pains: especially when we call to mind those things that are said above (*m*).

Yet this very physician has asserted, that a medicated water, "properly "prepar'd from the shells of oysters, or other shell-fish," succeeds more happily than that English lithontriptic, which has been disapprov'd by more than one very learned physician among the English, and particularly by Mead (*n*); for by the use of this water, he says, "small pieces" of not very hard calculi, "sometimes of sand, and at other times of very small "nuclei, as it were, are discharg'd together with the urine."

He commends the dissertation of that celebrated author Robert Whytt, upon this water. And you will read of experiments made at Helmstad, in another dissertation which was publish'd in the same place, under the patronage of the celebrated Krugerus (*o*); by which experiments it appears, that this water is of an *alkalino-sulphureous* nature.

(i) A. 1740. hebd. 41. n. 2. & a. 1745. hebd.

(m) N. 16.

3. n. 2.

(n) Monit. Med. c. 10. in fin.

(k) A. 1733. hebd. 21.

(o) Dissert. qua exhibentur Experim. cum

(l) A. 1731. hebd. 23.

aqua Ostrocoderm. instituta.

There have been some also, who mix'd acids with the alcalies; and found, that into the fluid, while thus effervescing, if calculi were thrown, they were either entirely, or in some measure, dissolv'd: for which reason they injected an effervescing fluid, of this kind, into the bladder of dogs; in order to make an experiment how far the bladder could bear it.

Yet although it was born by a sound bladder, could it also be born by one which is irritated, and ulcerated by calculi? Certainly not; since it is found by the experiments of Morand (*p*), that, in an ulcerated bladder, the disorder is increas'd by that former English remedy; although not in an effervescing state, and diluted by the quantity of urine, wherewith it descends to the bladder.

But let us return to calculi which are form'd upon needles.

20. A country-girl, almost of the same age with that formerly spoken of, by me, in the Ephemerides (*g*); for she died in her fourteenth year; having done the same thing as the former, sixteen months before, deservedly suffer'd the same misfortune. For having introduc'd a brass hair-bodkin, notwithstanding it was bent in the middle, very high into the urethra, she perceiv'd that it was suddenly snatch'd out of her fingers, and entirely hid within the bladder.

Being restrain'd by shame, she, not only then, but even almost quite to the time of her death, was silent as to the true cause of the pains, and uneasinesses, which she felt, and particularly in making water; which were so many, and so great, that a tumour having, at length, arisen in the hypogastrium, and the nearest part of the ileum, a pus was discharg'd by two foramina that it had made for itself; one larger and one smaller; the former of which was in the left ilium, and the latter on the right side; in that part which is properly call'd, with Laurentius (*r*), the *fines hypogastrii*.

Being thus affected, she was receiv'd into the hospital at Padua, a month or two before death. It was there easily observ'd, that, together with pus, urine was pour'd out through each of the foramina, but more through the left; under which was a cavity of a pretty considerable size, wherewith the right foramen, also, communicated.

As, in this cavity, the probe met with something hard; I was ask'd what I suppos'd this could be. I immediately call'd to mind what had resisted the probe, when it was introduc'd through the fistula, which had open'd itself in one of the ilia, and had discharg'd urine with the pus, in the former girl. And when I heard that this girl was also tortur'd with pains of the bladder, in making water, and that she discharg'd only a small quantity of urine, and that purulent; I answer'd that it was necessary to inquire, whether she had introduc'd a needle, or any thing else of the like kind, into the urethra.

The girl denied it; till the left foramen being enlarg'd, by a slight section of the common integuments, the point of the bodkin, and the greater part of its length, were evidently seen, within the cavity, by every body. Then what she could no longer hide, she too late confess'd. For even the bodkin could not be extracted, by reason of a calculus that was form'd upon it; which calculus, though it was easy to perceive it by introducing the probe

(*p*) Mem. cit.

(*g*) Vid. supra ad initium n. 19.

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(*r*) Hist. Anat. hum. Corp. 1. 6. c. 2.

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through.

through the passage of the urethra, or through that cavity, yet it was impossible to move, even the most slightly, without great pains.

And the same calculus prevented their injecting any thing into the urethra, to assuage the pains, by blocking up the passage. To these symptoms were added a very great wasting of flesh; the quantity of pus was increas'd every day; and the putrid smell, and the fever, became very violent.

These symptoms were follow'd by a loathing of all food; a vomiting, and discharge by stool, of a yellow liquid matter; a dejection of strength, and weakness of pulse; till death at length put the with'd-for end to so many miseries and complaints: among which none had ever been heard of a pain in her loins, by those who examin'd her upon that head.

The carcase, which seem'd to be a skeleton cover'd with skin, was dissected in the open air, and in a very large place, on account of the time of the year being very hot; for it was the beginning of July in the year 1738.

I, first of all, ordered the probe to be pass'd through the right foramen into the cavity of the ulcer; and the whole sinus to be laid open. This was betwixt the muscles of the abdomen and the integuments; nor had any communication, in any part, but with that cavity.

The cavity was in length, and in breadth, three inches; extending itself from the left ilium towards the linea alba, having a thin posterior paries, which the remains of the muscles, and the peritonæum made up, and by which it was separated from the cavity of the belly; but in the same paries, which was open on the right side, it communicated with the fundus of the bladder: and there a great part of the bodkin was prominent into the cavity of the bladder.

The abdomen was then cut into, in such a manner, that the incision did not reach to the bladder: which, although the cavity was small, had coalesc'd pretty high, that is above the os pubis, with the internal surface of the abdomen, in that part only where it lay open into the cavity of the ulcer; so that nothing could be discharg'd into the general cavity of the abdomen, wherein there really was not the least extravasated fluid.

And even the lower border of the omentum, which had scarcely any remaining fat, in most places, was closely connected to the neighbouring peritonæum of the bladder.

These appearances being seen, and the bones of the pubes being drawn asunder, the whole bladder was disclos'd to view; and itself, together with the urethra, which was found, laid open: the coats of these cavities were found to be thicken'd, but so contracted, that besides the calculus they could scarcely contain any thing.

The internal coats of these parts, which were unequal, and ulcerated, in many places, adher'd to the stone here and there: and were, like the cavity of the ulcer, in many places gangrenous also.

The calculus was a little more than two inches long, being somewhat thicker than a man's thumb, and, in its shape, resembling an egg, the vertex of which, was turn'd upwards; as the point of the needle was also; with all that part which went to the angle whereof I spoke in the beginning; being almost parallel to the calculus, and disjoin'd from it by the interval of an inch: the remaining part of the needle was, also, on the outside of the calculus, as far as could be conjectur'd, almost universally; the head only,

with some of the neighbouring portion of it, being very firmly infix'd to the middle and left side of the calculus; that is, cover'd over with the calculous concretion; which portion is, on that surface, and at both of its extremities, very unequal; on the opposite surface almost smooth and somewhat white; except where it was ting'd of a yellowish colour, as the whole left part is; which circumstances I describe as I now see them; for at that time it was bloody in some places, and in others of a dirty brown colour.

At that time also, the calculus being examin'd, as it is connected with the needle, by medical weights, was found to be a few grains lighter than seven drams; but now it is a few grains heavier than five drams and two scruples.

Most of the other parts of the belly were in a preternatural state: their appearances were as follows. Some of the intestines were a little livid, and somewhat turgid with that yellow humour which was last of all discharg'd: the liver was whitish: the spleen was pretty livid, and a little larger than it generally is.

But the ureters, and the kidneys themselves, were in a very bad condition indeed: for these canals were dilated, and full of pus; of the same kind with that which was found in the cavity of the ulcer in considerable quantity; for it was very liquid, and of a yellowish colour, inclining to white: or, in other words, it was a pus mix'd with urine.

And the kidneys were preternaturally enlarg'd, especially the right; which was also very hard, and internally hollow'd into small cells, that were in great number, and so distended with the same kind of pus, as the pelvis was also, that it rush'd out, to a considerable height, upon dissection. The adipose and proper coats of the left kidney; being join'd to each other, thicken'd, and indurated; confin'd the same kind of pus betwixt themselves, with which the surface of the kidney, that was eroded in some places, overflow'd; as the internal parts did also in several places.

But the very filthy odour, which exhal'd from the kidneys, and the bladder, forbade us going on to open the thorax; no mark of disease in that part having appear'd.

21. The dissection being thus finish'd, you will readily conceive, from what I shall here subjoin, somewhat more at large, what I then immediately said, according to my custom, to the many men of eminence, and others both medical and chirurgical practitioners, and students, who heard me.

What reason could induce this girl, and so many others, to thrust the heads of needles, or bodkins, into the urethra, is not so much to be inquir'd after in the lacunæ of the salacious humour; inasmuch as they open in other parts, and even on the outside of the urethra, unless you, perhaps, suppose that those canals also, which I describ'd (s) within the urethra of women, belong to this class also; as in the exquisite sense of the membrane wherewith it is internally invested.

For unless they applied the friction very high up in the urethra, it could not happen, that, by a sudden and strong contraction of the lower part of the bladder, the needle should be snatch'd out of their fingers, and be quite buried in that cavity; especially when the needle is pretty long.

For from the bladder, and its sphincter, I account for this misfortune, agreeably to the opinion of Molinetti (*t*); and not from a certain power of the uterus, as they say, which, even if it had this power of drawing towards itself, would not, however, draw what was thus acted upon, into the bladder.

In some cases the needles have fallen out, of themselves, after having been taken in; as happen'd to two girls that are spoken of by Vallisneri (*u*): to one when she was asleep, and to the other when she was making water: I suppose, because in these they had only enter'd the bladder in part; that is to say, the crooked needle easily remaining with one part in the urethra, while the other was retain'd within the bladder for a month.

On this part, however, no calculous matter had been form'd; as is also said not to have happen'd to a needle that was thrust in by a fourth (*x*), and discharg'd after fifteen days, at the time of making water; which needle it is probable had been obstructed, in its passage through the urethra, at its lowest and acute part, from this symptom; that she complain'd only of a sense of pricking about the neck of the bladder.

But although these things that I have said about the point of the needle, or bodkin, being fix'd in the urethra, will be more illustrated by what will be hinted afterwards (*y*); yet I shall not deny that needles, which have been receiv'd quite into the cavity of the bladder, may nevertheless be so turn'd therein, as, in like manner, to be discharg'd by the meatus urinarius.

But that to those two, whereof I spoke last, no calculous matter adher'd, within fifteen days, and even within the space of a whole month, there must have been more than one reason, as we have known this matter to adhere to others in a much less space of time.

For the urine, in all persons, is not equally impregnated with particles fit to recede therefrom, and generate a calculus: and some retain their urine longer than others do; and the matter, or surface, of different needles is different. Thus Vallisneri (*z*) has suppos'd that a silver needle, or bodkin, was taken out from the bladder, without the addition of any calculous concretion, merely for this reason; that it was silver: which conjecture, however, will be much more credible, if it shall, at any time, be confirm'd by other experiments.

Thus a concretion seems more likely to adhere to a pretty rough surface, than to a very polish'd one: and hence, perhaps, we are to account for this circumstance, that one part of the needle is, for the most part, cover'd with calculous matter; while the other is left quite naked: of the two girls, therefore, whose bodies I examin'd after death, in the former the head of the needle, or pin, had perforated the bladder; and in this other the point; because, in the former, the concretion more easily gather'd round the lower, and perhaps rougher part; and in the latter more easily about the opposite extremity.

But out of those women who have had a needle, which had been thrust into the bladder; and a calculus, of a considerable size, form'd upon it; none,

(*t*) Dissert. Anat. Pathol. l. 6. c. 8.

(*u*) Adnot. ad obs. supræ ad n. 19. cit.

(*x*) Ibid.

(*y*) N. 25. & seq.

(*z*) Obs. cit.

that I remember to have read of, carried it for a very long time, yet had the needle extracted afterwards, and was sav'd; except that Venetian woman, whose case is publish'd by Molinetti (*a*) (under whom she was cur'd in the year 1649) with a figure of the needle, and the calculus, added thereto, which he us'd to show in this anatomical theatre, where Moinichenius, in his epistle to Thomas Bartholin (*b*), asserts that it was seen by him; for Bartholin himself, as an author in other respects very learned, has through carelessness asserted, could not be *witness* to the calculus, which was extracted after he had departed from Padua, and even from Italy (*c*).

And this calculus is the same which is spoken of by the same Moinichenius, in his observations (*d*): and this I have hinted at, because, in the latter part of the annotation to the observation of Vallisneri, both of which I have often refer'd to, it does not seem to be acknowledg'd for the same, which Vallisneri had said was wont to be shown in this theatre, and is now preserv'd in his museum: for as to his saying, that it was taken from a Paduan, instead of a Venetian woman, that I suppose was the cause of the error, which would have been easily avoided, if Molinetti had been read, in whose book he seems not to know that it is describ'd; and I also say that Lanzonus seems to have been ignorant of it, as he would, otherwise, in his scholium to that observation of Moinichenius, have been less surpriz'd "that a bodkin of bone should have lain buried so long in the bladder, without any injury to the bladder itself: and even without any inconvenience to the girl."

This the words even of Moinichenius, and much more those of Molinetti, did not suffer him to suppose; not only when speaking of what she suffer'd in the extraction, but also when describing what she endur'd, both before, and afterwards.

Yet if the bladder of this girl was much less hurt by the needle, than the bladders of those whom I have written of; this probably happen'd because the point of the needle stuck longer in the urethra than in the bladder; and was, at length, push'd out of this passage, by the weight of the calculus forcing downwards from above, as Molinetti found it.

22. These calamities, and even death itself, may be prevented, by the person, who, being timely warn'd of the case, can extract the needle, before the accretion of any calculous matter; and this with such dexterity, that the bladder, as far as it is possible to avoid it, may not be injur'd. And this has been done with success, not only by others spoken of in the works of Vallisneri (*e*), but also by two of my friends in particular, whom I have commended to you already, I mean Marianus and Vulpius.

The former of these gentlemen; as he told me in a letter sent to me in the beginning of December, in the year 1720; took out a needle from the bladder of a country-girl, who already made bloody urine, after having industriously brought it from a transverse to a direct position. And it was a hair bodkin made of bone.

But that which I saw extracted by Vulpius, from a certain girl of this

(*a*) C. *supra* cit.

(*b*) 87. in hujus epist. cent. 2.

(*c*) Vid. cent. 1. epist. 73 & seq.

(*d*) Med. Chir. 22.

(*e*) Obs. & Adnot. *supra* ad n. 21. cit.

city, was made of brass. And he had extract'd it, a few weeks before I receiv'd the letter from Mariani, with the use of no other instrument, than a very smooth iron wire; one extremity of which he had so incurvated, into the shape of a small hook, and almost into the shape of a ring, that it could not hurt the bladder, and yet could lay hold of the pin; and would not suffer the head of it to slip, when once laid hold of.

However, if the case is not known till much later, and a calculus is already gather'd around the needle; and this calculus is not of such a kind, as to allow of its being easily drawn out, through the urethra; it will be necessary, before the woman be subjected to the tortures of a very difficult extraction, to make diligent inquiry, not only whether the bladder, which it is natural to all to suspect, but whether the ureters also, and particularly the kidneys themselves (which suspicion arises from our dissections) have already contracted so much disorder, that if even the needle and the calculus are taken away, the woman must die nevertheless.

And the conjecture of the kidneys being disorder'd, will not be taken so much from the pains of the loins, (which we have seen may be absent *(f)*), or, as it probably happen'd in the girl now in question *(g)*, may be obscur'd by the much more cruel tortures of the bladder, according to the aphorism of Hippocrates *(h)*, as from the suppression of urine in the bladder, which has sometimes preceded, continued for a long time, and been more than once repeated: or from the very frequent retention to avoid those severe pains; or from too small a discharge; in estimating which, however, we must take care, lest we are at any time deceiv'd by the continual dripping of urine; calling to mind that, with this stillicidium, a retention thereof may be join'd; and that in a very great quantity, as I shall show when I speak on the subject of lameness *(i)*: although this has, already, been sufficiently shown, even by other letters *(k)*. And indeed, the Sepulchretum will present us with a history *(l)*, in which you will read that the neck of the bladder was found so lax from paralysis, as “easily to admit the finger; for which reason the urine” came away, before death, without the patients feeling it: yet the bladder, “though almost twice as large as it naturally is, was entirely fill'd nevertheless.” And how much the retain'd urine had enlarg'd the ureters, you have learn'd from those letters; and how much it had, also, dilated the cavity of the kidneys, and had injur'd the substance thereof: or in one of them at least.

23. And if these things happen from a part of the urine being retain'd; how much more will they happen from a long, and repeated, suppression of the whole of it, within the bladder? Or from a frequent retention both of urine and of pus? At least you have many examples of this kind, in the Sepulchretum, from a suppression; among which are those of Rumlerus *(m)*, and Ballonius *(n)*; the latter of whom saw a very enlarg'd state of the ureters; and the former these canals full of urine, and the kidneys of so large a size, in a child, as they could scarcely have had in an adult.

(f) Supra, n. 2. & seq. & n. 13. & seq.

(g) N. 20.

(h) 46. sect. 2.

(i) Epist. 56. n. 12.

(k) Epist. 4. n. 19. & Epist. 39. n. 33.

(l) Sect. hujus 3. l. 27. obs. 2. §. 5.

(m) Sect. 24. obs. 12. §. 6.

(n) Ibid. §. 7.

And for this reason the celebrated Fantonus (*o*), with justice, suppos'd, that, where more urine is then drawn off by the catheter, than the bladder seems to contain, "it may partly flow down from the distended ureters also, and sometimes even partly from the enlarg'd kidneys.

That is to say, when the bladder can now contain no more; whatever urine is continually secreted in the kidneys, first distends the ureters, and after that the kidneys themselves also. Nor did this escape Aretæus (*p*). "Where the urine is suppress'd," says he (meaning in the bladder) "the superior parts also, that is the kidneys, are fill'd: and the urinary ducts, which the Greeks call ureters, are distended." And as these circumstances happen, where there is not said to have been any calculus, before, in the bladder, and where there is none at present; as may be read in the examples propos'd, and in like manner in that which is related by the authors of the *Commercium Literarium* (*q*), or in the acts of the Cæsarean Academy (*r*), or in the *Acta Helvetica* (*s*); for the discharge of the urine, from the bladder, being hinder'd by the abscess thereof, or by the coarctation of the passage through the prostate; or the influx into the bladder being prevented, by the very great diminution of its capacity; "an enlarg'd state of the kidneys, and of the ureters," or, at least, a dilatation of them so as to "exceed the thickness of the little finger, or even equal that of the largest," immediately occur'd to the eye; as these things, therefore, happen, even without calculi; they certainly ought not to have been imputed only to the obstruction of calculi in the ureters, which resists the descent of the urine, by a man in other respects very experienc'd: nor ought it to have been argued, from the circumstance of a certain person having only one calculus in the bladder but both his ureters dilated, that this calculus had necessarily been made up by the coalition of two; one of which had been obstructed in one ureter, and the other in the other.

But as those things, that I have mention'd, happen even where the bladder may be extended to a very great capacity; you, without doubt, perceive, how much more easily they must of course happen, if the bladder is either contracted into itself, as in one of the examples refer'd to, or has its cavity occupied by some foreign body internally, and leaves but little space for the urine within; and sometimes scarcely any; whether an ischuria, or a strangury only, be the consequence.

Thus you have, in the Sepulchretum (*t*), an observation of Silvius, after an ischuria, of the ureters "frequently admitting a man's thumb, and containing "urine within them, quite to the kidneys themselves;" as he says, not in the second, but in the first book, of his *Praxis Medica*, chapter the fifty-sixth: and you have, also, that which is describ'd as communicated to Riolanus (*u*), of the kidneys being "larger than usual, by one half; fill'd and "turgid with serum:" and "of the ureters being very large, and so distended as to be capable of admitting the little finger, with ease.

And you will read in the same place (*x*), that Cattierus found, after the

(*o*) Dissert. Anat. Renov. 7.

(*p*) De Caus. & Sign. Acut. Morb. l. 2. c. 10.

(*q*) A. 1738. Hebdom. 32. n. 1.

(*r*) Tom. I. obs. 164.

(*s*) Tom. 1.

(*t*) Sect. 24. cit. obs. 6. §. 8.

(*u*) Ibid. obs. 16.

(*x*) Sect. hac 25. obs. 8. §. 7.

strangury, “ the kidneys distended, and turgid with urine (from which parts “ when cut into, it flow’d out copiously) and the ureters very wide :” and these were found to be “ very large” by Fantonus (y), whom I have already quoted, even after a dysuria, from a cause of the same kind; and in proportion as the dysuria, like that, is more severe, it generally has the more violent strangury join’d therewith.

As therefore, in the two girls, whose bodies were examin’d by me, there had been a very severe dysuria, and the bladder was very much contracted, and almost wholly occupi’d with the calculus; it is not surprizing that the urine, before it could pass out a little more freely from thence, through a passage made by the needle, should stagnate in such a quantity in the ureters, and kidneys, as to dilate, and even to vitiate them; especially when mix’d with the pus, which flow’d from the ulcerated coats of the bladder.

For Eustachius (z), although he affirm’d, that when every thing was in a natural state, “ nothing could go out from the bladder, through the meatus “ urinarii,” nevertheless said, “ that he had sometimes observ’d the contrary “ to happen in many patients, in a great and long suppression of urine.”

For the orifices of the ureters being very much enlarg’d also, together with the ureters themselves, where they open into the bladder; no part of them now remains to pass obliquely betwixt the coats of the bladder: therefore, not only a portion of the urine may then return that way; but even, after the suppression begins to yield, or is already remov’d, the bladder, when contracting itself to discharge the urine, forces so much the more of that fluid upwards, through those enlarg’d orifices, in proportion as it can expel the less downwards, through the orifice of the urethra, of which the calculus now and then obstructs the passage.

But if it happens that the calculus has made only a slight obstruction just before, and a greater quantity of urine is, for that reason, discharg’d thro’ the urethra, so that but a small quantity now remains in the dilated ureters; you certainly conceive, that, if the calculus again oppose itself to the urethra, soon after, the urine, and therewith pus, if it happen to be in the bladder, may easily be driven up through the ureters quite to the kidneys; especially if the patient lies down while attempting to make water.

24. And these circumstances are, as you see, equally common to males, as to females; and may, at length, be expected from these stones also, which do not form themselves by accretion round a needle, in the bladder; as besides that history, of a young man, which I describ’d above (*), a great number of others, some of which I choose to take notice of here that you may add them to the Sepulchretum, demonstrate.

Henricus Henrici, in his dissertation *de Abscessu Mesenterii* (a), speaks of a girl of five years of age, whose ureter, by reason of the urine flowing back into it, on account of a calculus of the bladder, “ resembled an intestine;” and the kidney on that side was three times the size of the other.

In the *Acta Eruditorum Lipsiensia* (b), an observation is extant, made by

(y) De Observ. Med. & Anat. epist. 8. n.

(*) N. 15.

25. (z) Traët. de Renib. c. ultimo.

(a) §. 5.

(b) A. 1685. M. Mart.

Groenvelt on a calculous girl, whose ureters resembled one of the small intestines, by their capacity being enlarg'd. And Mauchartus (*c*) saw the same canals (in an old man who had often been afflicted with a strangury, from a calculus of the bladder) "inflated like the intestinum ileum," from urine like butter-milk, which they contain'd; at the same time that the kidneys were very large and unequal, and had their *pelves* distended to the magnitude of an egg.

Laubius (*d*) not only saw the ureters very much dilated, together with the *pelves*, from the same disease, join'd with the same symptom, but also with the kidneys diseas'd; the one labouring under an atrophy, and the other being large, and ulcerous. After the same disorders, Lospichlerus (*e*) found the ureters, in a merchant, so distended with the stagnating urine, as easily to admit "the entrance of a pretty large thumb:" and Brunnerus (*f*) relates, that, in a man of princely dignity, they were less turgid; but that, the back part of the kidneys being cut into, "the urine had rush'd forth in a full stream."

You will perhaps say, that the disorders, which are spoken of, in the kidneys, and ureters, of those who are afflicted with a calculus of the bladder, ought not to be imputed to this calculus, when it is already in the bladder, but when it stuck in the kidneys, or the ureters; and that Butzmann had judg'd in this manner (*g*), when, in a child, who had been long tortur'd with the disorders we speak of, he found a sacculus full of pus, instead of the kidney.

And you will likewise say, perhaps, that it seem'd to Rudolphus Jac. Camerarius (*h*), in a little boy, who was affected in the same way, that the cause of a purulent kidney, and of a dilated, and eroded ureter, should be accounted for in the same manner.

And indeed, that two observations of Coschwitz (*i*), and one of Schulzius (*k*), are extant, in none of which mention is made of a calculus in the bladder; but in all of calculous pains: in the two first, it is also said that the kidneys were purulent, and that the ureters had been surprizingly dilated: in the third, it is not only said that they were dilated, but they are even describ'd, as "writh'd into several folds," almost like the small intestines, as in the stable-keeper (*l*); so great an effect had the urine produc'd, as even to enlarge the ureters longitudinally.

Yet that the urine had not flow'd back upwards, from the bladder, was demonstrated by the orifices of the ureters: as both of them in this third observation, and one of them in the first, were shut up by angular stones sticking therein, or small testaceous concretions, as it were, bringing on a spasmodic constriction by their sharp points.

I, however, have never denied but that the kidneys may, sometimes, and, if you please, often, be vitiated, and the ureters distended, in that other manner also. And I even say, that if this has preceded, and the calculi then

(*c*) Eph. n. c. cent. 8. obs. 15.

(*d*) Ibid. obs. 22.

(*e*) Cent. 1. obs. 58.

(*f*) Cent. 9. obs. 2.

(*g*) Dec. 3. a. 7 & 8. obs. 27.

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(*h*) Specim. Experim. circa Generat. f. 2. c.

3. hist. 3.

(*i*) Dissert. de Valvul. in ureterib. §. 5 & 7.

(*k*) Dissert. de Vass. umbilical. §. 6.

(*l*) Epist. 4. n. 19.

at length falling into the bladder, and obstructing, or pricking it, the second shall of course succeed; the disorder of the kidneys, and of the ureters, will be so much the more increas'd by the regurgitation of the purulent urine, in proportion as they have been more affected or weaken'd by the first mode of disease.

You plainly see then, what a prudent lithotomist ought to attend to, when sent for to extract a calculus, from a patient who has suffer'd many and grievous disorders therefrom; and how cautious he ought to be of undertaking the operation: or if he is, at any time, compell'd, by the impatience of the patient, to perform the extraction, at least what he ought to predict, in regard to the danger and disorder which may remain even after the successful extraction of the stone.

"If ulcers of the kidneys," says Aretæus (*m*), "are brought on by calculi, incurable disorders arise therefrom: and a speedy colliquation, and death, come on:" in which opinion he was preceded by Hippocrates (*n*), who even pronounc'd in general, of suppurated kidneys, "that this disease was very violent; and that many were, thereby, brought to a tabes renalis:" and if the patient is much advanc'd in age, not only (*o*) "that disorders of the kidneys, and bladder, are with difficulty cur'd," but also (*p*), "that he had not seen disorders of the kidneys cur'd when the patient was above fifty years of age."

I am not ignorant, indeed, how much is to be attributed to fortune in these things, as well as in most others: for I remember that the cure of a Venetian nobleman, of more than sixty years of age, which had been despair'd of by Alghisi, for more than one reason, and these not slight neither; was soon after undertaken, and very happily perform'd, by that friar Jaques Beaulieu, as I formerly declar'd at large, by letter, to the celebrated Morand, who requested it of me: and I have read of another cure in the Sepulchretum (*q*), which was more hazardous in the beginning, but had not an unsuccessful event.

And in the Sepulchretum (*r*) is also extant the history of a princefs, who; having been before tortur'd with very violent pains of the loins, together with a discharge of blood, and pus, in the urine; and being afterwards freed from them, and at length carried off by another disease; had a small calculus in the kidney "around which a beautiful cicatrix, sound, and clean, and of the length of half an inch," had been form'd.

And indeed, read over the observation of Brunnerus, which I just now quoted, on the prince. You will not only perceive, that the same palliative method of cure, which I said above (*s*) Valsalva had been wont to recur to, had been of so much advantage to this princely patient, that Brunnerus has justly said, which I wish lithotomists would remember in hazardous cases, "therefore lithotomy will not always be absolutely necessary in the calculus of the bladder;" but moreover, "what almost exceeds belief, that the dissector had found cicatrices in the bladder," of the ulcers which the cal-

(*m*) De Sign. & Caus. Diuturn. Morb. l. 2.
c. 3. in fin.

(*n*) De Intern. Affect. n. 16.

(*o*) Sect. 6. aph. 6.

(*p*) De Morb. Popular. l. 6. sect. 7.

(*q*) Sect. super 23. obs. 4. §. 13.

(*r*) Sect. 22. obs. 26. §. 8.

(*s*) N. 16.

culus, and a contrary method of treatment, had before produc'd: although the patient was more than sixty years of age.

But, without doubt, it is a very different thing to consider what rarely happens, and what happens the most frequently: and, to return to the cases of the girls we were speaking of, it is one thing to be sent for in time, and another when the disease is very far advanc'd: this will appear from an observation that was written to me, in the same letter, which I mention'd above (*t*); that is by the very experienc'd physician Laurence Mariani.

25. A young country-girl, having had a bone bodkin, which she us'd for her hair, drawn into the bladder, in the same manner as in those already spoken of; although it created pains, and many uneasinesses, they did not, nevertheless, extort a confession of the fact, before that a calculus, having form'd itself around the needle, she was affected with intolerable tortures.

Then, at length, the situation thereof being examin'd, the point of the needle was found to be prominent within the cavity of the vagina; the urethra being perforated near to the lower part of that cavity.

It seem'd to Mariani, that, if the urethra were cut into a little, in a longitudinal direction, this point might be drawn into the urethra; and, by this means, the needle and the calculus being plac'd in a direct situation, it might be tried whether by scaling away this calculus, which was, perhaps, of a fragile nature, gradually and dexterously, it were possible to reduce it to such a state of thinness, as to suffer it to be taken away with the needle.

But as others were of a contrary opinion, it happen'd that nothing at all was attempted; but that the girl was deserted, and given up to her miserable lot. In process of time the calculus, and the pain also, were increas'd; and the whole orifice of the bladder being now almost stop'd up, but a small quantity of urine, and that very ill-smelling, was discharg'd. And a fever also coming, on an end was, at length, put to her miserable life.

The belly being open'd, pus was seen in the pelvis thereof, and was suppos'd to have been pour'd out from the kidneys, which were suppurated. In the bladder, which was corrupted with a sphacelus, was a calculus of the figure of a pear; for the more it descended from the head, and the upper part of the needle, the more was it extenuated.

When it was taken away from the bladder, to which it adher'd in some part, it left scales agglutinated to that part: and yet when put in the scale, together with the needle, was then equal to eighteen drachms; but afterwards, when this account was sent to me, it weigh'd no more than fourteen.

26. The person who, as I have said above (*u*), had successfully extracted the needle from another girl, before a stone had been form'd upon it, did not despair but this also might be taken out; even when the calculus was begun, and increas'd to a considerable size; if, the point of the needle being reduc'd into the urethra, and held fast with a forceps, he endeavour'd, previously, to extenuate the calculus, if it were possible, before he drew it out; in imitation of Benivenius (*x*), who diminish'd it in the urethra of a virgin, in some measure, previously to its extraction; or if this did not succeed

(*t*) N. 22.

(*u*) N. eod. 22.

(*x*) De Abditis Morbor. Causis c. 80.

according to his wish, then to imitate Molinetti (*y*), who had taken care to have it extracted by force, at all events; and it is probable that something might even then have been of service.

But after the calculus had been so much augmented in its size, and with this every disorder had increas'd, who is there that could hope for any advantage? And if the calculus had been so much thinner, and the passage, through which the cavity of the urethra, communicated with the cavity of the vagina, had been so much larger, as they must both of them have been in a case of this kind, which, being sent from Italy, you read of in the history of the Royal Academy of Sciences at Paris (*z*), perhaps this also would have fallen out into the vagina, in the same manner as that did.

But I should believe, even in that case also, that the passage had been from the upper part of the urethra, rather than from the bladder, into the vagina; since we read that an afflux of urine, through the vagina, did not succeed, but only an incontinence of urine.

For whether the needle is not wholly snatch'd away from the fingers, into the bladder, in many persons, as I conjectur'd above (*a*); or, if you please, whether, after it is wholly carried into the bladder, it is again push'd back into the urethra, by the contraction of the bladder; although the former of these suppositions seems to me the more probable, since the point that was held in the fingers, and not the head, or, at least, in the examples of Molinetti, and Mariani, and in as many that I shall immediately produce, was certainly turn'd towards the urethra; nothing can more easily happen, than that, the head being push'd forwards, by the posterior part of the bladder, in consequence of the annex'd vagina, then libidinously turgid, being, in like manner, forc'd forwards, the point of the crooked needle is driven backwards; and by this means fixes itself into the posterior part of the urethra, especially if it be very sharp: and at length, being driven by the frequent contractions of the bladder, perforates that part.

And as this happen'd in a young country-girl, who applied to our surgeons at the time of my writing this letter, so it would also have happen'd in a young virgin of fourteen years of age, the case of whom was related to me by a surgeon, whose preceptor in anatomy I had been; not long after the death of the other, whose dissection I have describ'd to you (*b*).

This girl was in a sitting posture when she did the same thing as the other, and had thrust the head of the bodkin, which was almost as thick as the urethra itself, very high into this meatus; and being terrified by the sudden appearance of her mother, at once let go the bodkin, and found it drawn up very high, at the same time.

Almost four days she bore the pains and uneasinesses in silence; on the fifth she told her mother the affair, and her mother told it to the surgeon, of whom I have spoken. Who supposing, from the seat of the pricking, of which the patient chiefly complain'd, that the lower part of the needle stuck fix'd about the middle of the urethra; and fearing lest, if any instrument were introduc'd into the urethra, to extract this inherent body, it should be entirely

(*y*) C. cit. *supra* ad n. 21.

(*z*) A. 1735. *obs. anat.* 10.

(*a*) N. 21.

(*b*) N. 20.

push'd on into the bladder; he with the consent, and even at the request, both of the mother and daughter, introduc'd first one finger, and then another, into the vagina, and by this means so far mov'd the needle downwards, with no less industry than success, that the point began to appear at the orifice of the urethra, and could be laid hold of with the forceps.

Thus, with the loss of two drops of blood only, and without any inconvenience remaining behind, the needle, which he brought to me, was taken out. This needle, or bodkin, was, or, at least, seem'd to be, of tin, and was of that kind which women use for their hair, being four inches long, and having a very sharp point: and the surgeon had observ'd that a little tartarous matter had already begun to adhere to it, in several places; which matter was, afterwards, very improperly rub'd off.

27. I would not have you be chagrind to find that what has been asserted by some persons, seems to be confirm'd by the number of examples I have added; I mean that the women, to whom these things happen, "are the greatest part of them Italians." I could wish all our country-women knew how many of their sex have been untimely carried off, by the most excruciating tortures from this cause.

But how can country-girls, or girls of the lower class, and such as even their tender years render unexperienc'd, be acquainted with these things? Yet such instances ought not to be pass'd over in silence, that physicians, being admonish'd by the frequency of them, may, if any girl begin to complain of a difficulty of making water, inquire very narrowly into every circumstance; and, by a cautious dexterity, force out the truth, while it is as yet possible to administer relief.

However, neither these instances are common to all parts of Italy, (or, at least, not to some of them, where I have been for a considerable time) nor are all foreign countries free therefrom; which examples it is by no means necessary for me to take notice of here, with an odious diligence: some of them you will learn, if you ask me how, from reading Vallisneri (*c*), others from Platner (*d*); and, finally, some you will meet with in the reading of other authors.

Nor do I doubt but more examples would be extant, if as many bodies were dissected in every other place as there are in Italy; or if shame did not oblige most women to conceal the true cause of their disease. For others; as even among the women of this region a country-girl was about to do (*e*); and as some, according to Alghisi (*f*), and Vallisneri (*g*), have done; conceal the whole affair with the most obstinate silence: it therefore happens, that the needle, of which no body has any suspicion, is buried together with them.

And some girls pretend to have swallow'd it; in order that physicians, notwithstanding they find it either in the living, or the dead body, may be deceiv'd by such an assertion.

There was a time when such deceptions took place even in Italy; as by that Venetian virgin spoken of by Alexander Benedictus (*h*), about the lat-

(*c*) Obs. supra ad n. 19. cit.

(*d*) Dif. de Calc. ad Vesic. adhær. §. 10.
not. & p.

(*e*) N. 20.

(*f*) Litotom. c. 3.

(*g*) Adnot. ad cit. obs.

(*h*) Hist. Corp. Hum. l. 2. c. 9.

ter end of the fifteenth century, who had a large calculus form'd upon a very long bodkin, such as women use in their hair : for notwithstanding this author has rejected the opinions of those (*i*), who suppos'd the needle to have pass'd through the veins, from the stomach to the liver, from thence to the heart, and from this viscus to the kidneys, and so on to the bladder ; yet he himself thought, " that by its point, it had, gradually, and in a long course of time, penetrated through the intestines, and made a passage for itself to the bladder : " although he is much to be commended for having discarded the opinion, which, to my great astonishment, was embrac'd by others, even a long time after, and is not easily to be imitated in proposing another, which had a much greater number of followers.

Nor is the question, here, of any slender needle, but of thick ones ; and very often of those which have a large head at one extremity, and, at the other, not a very sharp point ; and always (I mean in those shame-fac'd virgins, who say that they had been swallow'd by them) purposely, as it were, going to the bladder ; and not attended with those previous, and concomitant symptoms, and pains, which a circumstance and passage of this kind requir'd.

Wherefore this kind of credulity is now more rare ; or, at least, among the more learn'd Italians ; the retention of which, in some other countries, I see pretty clear marks of, even in some excellent books. It remain'd to take notice not only of the needle, but of the case wherein they are kept, having pass'd the same way ; since that excellent man, Benevoli, says, that he had extracted one from the bladder of a Tuscan girl (*k*).

Here again, you will perhaps be displeas'd, that a vice almost incredible should be imputed to an Italian girl. But read, I beg of you, the annotations that are made to article one thousand three hundred and fifty-nine (*l*) of Platner's *Institutiones Chirurgiæ*, and you will see whether she was the first that had attempted this thing.

Yet if they had made use of that way of Alexander Benedict, to explain the passage of any needle, not into the female bladder ; into which a very short, and quick opening, lies from without ; but into the male bladder, the passage into which is much longer, and more winding ; I should more readily, as I have said in a former work (*m*), and particularly in some cases, fall in with their opinion.

And I wish it was in my power to fall in with their opinion in this case that I shall immediately describe to you : I should then have complain'd less at that time, and even now, that, in proportion as a thing is more certain, it is so much the more difficult to be conceiv'd of.

28. A country-man, of forty years of age, had labour'd, for a long time, under a very great difficulty of making water : nor on this account only, did he come into this hospital, a month before he died, but on account of an ulceration of the scrotum, and a fever likewise. To his fever was first added a diarrhæa, and after that a costiveness : and a greater wasting of flesh came on every day ; which being carried to its greatest possible extent, and his face

(*i*) L. 5. c. 13.

(*k*) Oslerv. 42.

(*l*) Not. b.

(*m*) Adversf. 3. animad. 36.

being become cachectic, he was, at length, taken off by the old pains in his bladder.

When he was very near death, he seem'd to be desirous of what few men of his condition in life are; I mean that the cause of this very long, and troublesome dysuria, should be inquir'd into by dissection. He therefore call'd the surgeon to him, and told him that, two years before, he had introduc'd a hair-bodkin made of brass, into the urethra; but whether it had fallen out, or still remain'd there, he scarcely then knew, and was ignorant even to the present moment.

But in what manner, and for what purpose, he had introduc'd it, he did not say, nor did the surgeon inquire; as the man was now dying, and had declar'd even thus far, with some degree of shame. The surgeon having made this relation to me, and I being at that time accidentally engag'd in demonstrating some things, in the hospital; both natural and preternatural, I immediately order'd the carcase to be brought, in order to add this inquiry, which I suppos'd to be short, to the others.

And as I suppos'd that the needle had stuck at the flexure of the urethra; or if it had accidentally fallen out, that it must, at least, have left some great marks of injury there; I thought proper that the urethra should first of all be laid open, longitudinally, to that part.

The scrotum therefore, which was still ulcerated from the dripping of the urine, as I suppose, being cut into, the testes seem'd to be larger than they naturally are, and quite tumid; but it easily appear'd that this was owing to the coats being become very thick and white: and not to their proper substance being distended. For this, notwithstanding the tunica vaginalis adher'd, in several places, to the tunica albuginea, was pretty sound; except where it is connected with the inferior globe of the epididymis: for these parts were purulent, and blackish in their colour.

The urethra being then open'd; from its external orifice, through the whole inferior surface of the penis, and the perinæum; I found the internal surface of this meatus to be neither ulcerated, nor cicatriz'd, nor red: and I even found it to be every where whitish and smooth; but become pretty much thicken'd.

Thus when I perceiv'd that I must carry on my researches still farther, I immediately order'd all the other parts, that belong to the urinary secretion and excretion, to be taken out. The bladder was without urine, and contracted into itself, but of an irregular figure. For at the upper and right side, it grew out into a kind of small bag, of a square figure, that was already blackish in its colour.

What this sac was, and what it contain'd, appear'd plainly to all; after first cutting into the upper part of the urethra, which still remain'd to be examin'd on the anterior surface, and after that the bladder itself. And in this part of the urethra, quite to the whole seminal caruncle; which was strigose and shrivel'd, yet furnish'd with a sinus according to its natural state; we found no more traces of disorder, than in the other part of the urethra, that we had before dissected.

But immediately above the caruncle, the whole internal surface, not only of the prostate gland, but of the bladder also, was found to be ulcerated;
and

and cover'd over with a kind of whitish eschar, as it were, or crust. And the coats of the bladder, as was observ'd by cutting into them, had become thick; being partly livid, and black, partly white, and almost scirrhus. Nor did the sac, of which I have spoken, put on any different appearance: for it not only communicated with the bladder, by an orifice of equal extent with itself, but was even made by a production of all the coats of this reservoir.

Within this bag was a calculus, of the bigness of a middle-siz'd, or rather of a small walnut; being somewhat like this nut even in its figure, and smear'd over with a humour that resembled the white of an egg, but not in great quantity: from the side of this calculus, pretty near to one extremity, came out that needle, and was prominent to the extent of two fingers breadths; the remaining part of it, which belong'd to the head, being buried deeply, or, at least, very firmly, within the calculus; so that it might seem to be equal to, or even perhaps to exceed, another finger's breadth.

But the other part, which belong'd to the point, that was very sharp, and was itself perfectly strait; in consequence of its being a part of one of those needles, which is pretty strong, and not thin; only pass'd obliquely downwards beyond the orifice of the sac, so as to fix its point into the lower, and left side, of the contracted bladder; from whence it was drawn out with great ease.

What weight the calculus was then of, I did not inquire: but, on inquiring, seven years after it had been found, it exceeded, together with the needle, two drachms and as many scruples, by ten grains; or, if you please, according to the use of medical weights here, by half a scruple. In the place where I kept it, was a yellowish powder deposited; for it is of a surface not smooth, and, for the most part, inclining to that colour.

In the bladder, however, the orifices of the ureters were much larger than they generally are: the ureters were very wide, and distended with pus to such a degree, as, in some places, to equal the thickness of a man's thumb. The kidneys also were turgid, and much enlarg'd beyond their natural size: being externally pallid; but internally semiputrid, and abounding with a ciceritious pus. To examine the other parts of this body I thought unnecessary; and indeed had not leisure to do it.

29. This rare, and if you weigh all the circumstances properly, this perhaps singular observation, I made on the twenty-ninth of December, in the year 1742, before a very croud'd circle of students and doctors; and the summary thereof I sent, in a letter, to the celebrated Morand, in July of the following year: this eminent man wrote back to me, that he had communicated it to the Royal Academy of Surgeons, and nothing more on this subject that ever came to my hands.

But my reason for sending him the account, was that, if any thing of the like kind had happen'd at Paris (a city very famous for the number of its inhabitants, and besides other sciences, particularly for that of lithotomy) I might be inform'd thereof; and might not be ignorant in what manner they suppos'd this to have happen'd. When I speak thus I mean to speak of a needle of the same length, firmness and straitness, as ours is; for that a shorter, or flexile needle should have reach'd to the bladder, through the passage of the male urethra, would not be equally surprising.

I had

I had read, indeed, in Parey (*n*), of a calculus taken out of the male bladder, “of the thicknefs of a walnut, in the middle of which a needle, perfectly like thofe commonly us’d by fempstreffes, was found to be fix’d.” But if it was buried within the calculus, it was of courfe fhorter than ours: if it was prominent from the calculus, we are, nevertheless, ignorant what length it was of.

And in what form it appear’d; whether it was a little bent, or ftrait; but in particular, whether it had come in by way of the urethra, or not; we are quite ignorant. For there might be different ways whereby a needle, efpecially one that had no head, might come into the bladder.

Thus that very learned man Mead fuppos’d a fimilar needle; which Chelfelden (*o*) gives a figure of, if I rightly recollect, in the thirtieth plate; and which, having a calculus form’d around it, had been taken out from the bladder of a boy, by incifion; to have enter’d in by the perinæum: and Vallifneri (*p*) fufpected that a fmall branch of a certain plant, which he had found within a calculus of the bladder of a boar, had come thither through a wound that had been inflicted on the belly of this animal, by fome hard and fharp branch of the thick foreft, through which he had run: but whether another “kind of woody little body,” which is faid to have been found in the bladder of a domeftic fow (*q*), might have come thither in the fame way, you yourfelf will determine.

Moreover, there might be another paffage for a needle; I mean that which is propos’d by Benediët, from the inteftines into the bladder; for although I faid above (*r*), that this was not readily to be admitted, yet I do not think it is always to be rejected; efpecially when what I have there objected can have no place.

I will endeavour to illuftrate what I mean, by an example which I do not remember to have been refer’d to, by thofe who have taken notice of others of this kind. You have it among the *Refponfiones Medicinales* of Claudinus (*s*). A boy had fwallow’d a needle, which he himfelf, after fome years, took out of his urethra, where it was driven by a very great effort in making water; having a thin ftone form’d upon it.

By what paffage this needle had come into the bladder, or at leaft into the urethra, was demonftrated by long, round, and living worms; fome of which he difcharg’d, in his urine, in the firt years after having fwallow’d the needle: and after pains of the urinary parts, and even after the needle was taken away, another living worm of a confiderable length was difcharg’d, and not without foetid matter, which was of a black colour.

And as you fee that this example may be added to thofe which I have taken notice of above (*t*), when fpeaking of worms difcharg’d by the urethra; fo you alfo perceive, that, although the needle, in the cafe of this boy, exceeded two inches in length, and was not without a head, yet it cannot be transfer’d to thofe girls, who fay that their hair-bodkins have come down from their mouths into their bladders; if it be certain that they have fuffer’d none

(*n*) Oper. l. 24. c. 19.

(*o*) The Anat. of the Human Body.

(*p*) Opere tom. 1. p. 6. nella lettera al Gi-
orgi.

(*q*) Eph. n. c. cent. 7. obf. 7. cum Schol’o.

(*r*) N. 27.

(*s*) Refp. 40.

(*t*) N. 6.

of those symptoms, which demonstrate that a passage, from the intestines to the bladder, was laid open: yet as this is not certain in regard to the man spoken of by Parey, nothing forbids us to suspect that the needle might have made the same kind of passage for itself, formerly, in him.

But there are others, in whom there is no room for these suspicions, as they, like ours, confess the contrary; one, that he had thrust into the bladder, thro' the urethra, an ear of barley; the other, if I understand rightly, the thin extremity of a small iron spatula or spoon. And I confess it, because I have read of the latter in Dionis (*u*), and of the other in Platner (*x*). But of what length the extremity of that spoon was, and whether it was at all inflected, I do not yet know; how flexible the ear of barley is, there is nobody who is ignorant.

Besides both of them, as it seems to me, or at least one of them, has confess'd that what he had begun to thrust in, he had forc'd on farther, and even quite into the bladder. But our man was so far from pushing forwards the needle, which he had introduc'd into the beginning of the urethra, that he was, as I have said (*y*), quite ignorant whether it had fallen out, or remain'd.

Let us suppose, however, that he did push it forwards; yet when he had brought it on to that flexure, which is in the perineum, how, I beseech you, could he, at length, get over that obstruction? and how could a needle of such a length, and so strait, be turn'd upwards? Why did it not stick there? Why with so sharp a point, if this went foremost, did it not fix itself there? Or if, as is most probable, the point did not precede, why did it not injure that part, while the needle was turn'd? For there was, as I have said, no cicatrix there.

These therefore, are things which I confess I cannot yet attain to the compleat knowledge of: and all very skilful men have confess'd the same; in particular Cocchi and Benevoli, who each of them visited me with very great politeness, as they pass'd this way; and saw, and consider'd, the subject very attentively.

It is true, that, in regard to very small, and for that reason flexible, needles, I should not be in any doubt; much less in respect to very slender wax candles: of which if you read the case, that in all appearance is the same, although it is repeated, in other words, twenty-five years after (*z*); you will be less surpriz'd, even if you admit only of some part, that the female bladder should suddenly draw a needle into its cavity; when you also find that the male bladder "had suddenly drawn in a candle."

30. As to the kidneys and the ureters, being both of them enlarg'd, in our rustic; and both of them being fill'd with pus; these circumstances doubtless agree with those things which are laid down and explain'd above (*a*). And from the same cause, that is from the urine being very frequently retain'd, on account of the very violent dysuria; and for that reason forcing some part

(*u*) Cours d'Operat. de Chirurg. 3. De-monstr.

(*x*) Disp. supra ad n. 27. cit. §. 11.

(*y*) N. 28.

(*z*) Eph. n. c. cent. 1 & 2. obs. 152. & act. tom. 4. obs. 24.

(*a*) N. 22. 23.

of the bladder outwards, where it was weakest; I think that the *sacculus*, in which the stone lay, is to be accounted for.

And that this was my opinion, even at the time when I first wrote, in the *Adversaria* (*b*), what I had observ'd of these *sacculi*, you very well know, from what is there said. But that this was afterwards confirm'd by others, I am not ignorant; as they produc'd the examples of gravid women, whose bladder had been, in some measure, relax'd, from a violent *ischuria*, into *sacculi* of this kind; or *herniæ*; by which name I had also call'd them: yet I do not very well see, why, among these examples, is reckon'd that which is extant in *Ruysch*; in his eighth *Theaurus*, number one hundred and two; unless, perhaps, that, which is there describ'd, is not intended, but the other which is repeated in the same place, on occasion of the foremention'd instance; that is to say the first observation of the *Centuria* of *Ruysch*: with which observation you will compare another given us, in the acts of the *Cæsarean Academy* (*c*); and you will easily understand, what the tumour was, in a very noble matron, which hung down from the genitals; upon the incision of which a large calculus was discharg'd, together with the urine: and an incontinence of this fluid, or rather, a *stillicidium*, or continual dripping, succeeded, in consequence of the wound that had been made, not being heal'd.

Yet these two observations, and some others, that may seem to be of the same kind, of *Rembertus Dodonæus* (*d*), shew that the *sac* was not form'd more by the impulse of the urine, than by the weight of the calculi, or at least not more increas'd; and that in the lower part of the bladder: where *Riolanus* had also seen it formerly (*e*), and from calculi indeed (*f*), but at the sides of the bladder, and sometimes only.

Yet now I see, that they are suppos'd at the sides, and particularly the left, in most persons; and that by some, at least, as if the appearance were natural. What I have seen of the figure of the human bladder, in a natural state, I have already declar'd in a former work (*g*). Whether it has these sinusses, or appendages, as they call them, besides, I shall not willingly dispute here.

It would be sufficient for me, if all the circumstances, which I advanc'd in regard to this figure, before *Weitbrecht*, were related in such a manner, by some persons, that I might not seem, with divine permission, to have propos'd them after him: although nobody can have read that dissertation of his, without being put in mind of the time, in which each of us publish'd our remarks; I mean by that very annotation, which the no less just, than learned, imperial academy at *Petersburgh* (*h*) has, of its own accord, added to that dissertation.

Nor have there been some wanting, who have confounded those sinusses seen by *Riolanus*, and others, promiscuously with those, which I had observ'd, from the urine being too long retain'd in the bladder, and not from calculi, of which first kind those two appendages, probably, might be, that *Berger*

(*b*) III. *Animad.* 36.

(*c*) *Tom.* 4. *obs.* 95. in fine.

(*d*) *Medic. obs.* c. 45.

(*e*) *Anthropogr.* l. 2. c. 28.

(*f*) *Encheirid. anat.* l. 2. c. 30.

(*g*) *Epist. anat.* l. 1. n. 61.

(*h*) *Comment.* tom. 5.

(*i*) found in the bladder, like sacculi; for they were full of urine, and were in an old man who had died of a suppression of urine: and that they were of this kind, we should more certainly know, if he had observ'd the places from which they were prominent.

But there had been persons before, who explain'd the origin of sacculi of the bladder in a different manner (*k*); some accounting for them even from a primeval conformation; and others from a calculus, which, growing by degrees, betwixt the coats of the bladder, forms to itself a sac, hanging from the bladder by the separation of these coats: and the internal coat being at length ruptur'd, or corroded, the calculus communicates with the cavity of the bladder; which explanation of the communication, a certain person not long ago made his own; although in the whole of that disputation, in which he has canvass'd the various modes, wherein calculi adhere to the bladder, he has no where expressly taken notice of those sacculi that are prominent on the outside of the bladder.

However, I am not altogether repugnant to these two origins of sacculi being suppos'd, in some certain cases; though that they should be suppos'd in all we cannot allow: as not only other observations of ours, which have been describ'd in other places, but as that also, in particular, which was just now describ'd (*m*), are openly repugnant thereto.

For you see from the Adversaria (*n*), when, in a great drinker, some sacculi were already form'd, and others began to be form'd, that the beginnings of them had appear'd only in those places, where, by reason of the spaces, which the muscular fibres of the bladder leave betwixt each other, the coats could be urg'd outwards: and who can imagine, that the sacculus of the country-man had existed from the original formation, rather than that it had succeeded to the very frequent retention of urine, from the needle, or calculus.

Nor indeed could a calculus, which was form'd upon a needle, that was thrust into the cavity of the bladder, have been form'd betwixt coat and coat; nor consequently, could it have burst through the internal coat, to open a passage for itself into the bladder. And there has not even been one, out of all those in whom I have found these sacs, wherein that coat was ruptur'd: whereas in all, as well as the other coats, it was relax'd, and had expanded itself, in order to form the sacculus; as you will learn from reading over again the dissections of the countryman, and of a certain old man of whom I wrote to you formerly (*o*).

Nor did I see calculi within those sacculi, if you except the country-man; nor yet did I understand that there had been any before: nor did it happen to me to meet with these sacculi, at the very mouths of the ureters, or beneath; but above them and even much above; as you will clearly perceive from those observations of mine, which I have refer'd to.

31. These sacculi, then, are different from those which are form'd by stones sticking at the narrow orifices of the ureters, and increasing there; as

(*i*) Hist. de l'Acad. R. des Sc. a. 1704. obs. anat. 22.

(*k*) Sect. hac Sepulchr. 25. in Schol. ad obs. 3.

(*l*) Ibid. in Schol. ad §. 7. obs. 8.

(*m*) N. 28.

(*n*) Animad. cit.

(*o*) Epist. 21. n. 15.

Petrus Francus (*p*) formerly knew, although he has neither been quoted by Riolanus (*q*), nor by Willis (*r*), nor by any of the great number of other authors, that I know of, who have been of the same opinion, even to this time, Platner only excepted (*s*); who has also given a copy of that small part of his very rare book, which relates to this subject.

But as to Platner's having follow'd Littre (*t*), and Abraham Vater (*u*), so far as to add, that, unless the calculi fall out from thence, "they seem to make a new passage for themselves; while, the bladder being now and then very strongly contracted, they are propell'd, within the coats of it, towards the cervix: and that this is the reason why they are often found in places that are very remote from the mouths of the ureters;" I should readily fall in with his assertion, when passages lie open from the lowest part of the ureter (as were seen by Littre) to those places; which, when once open'd by calculi, it is most probable must be kept open afterwards, by the urine that is continually following them: and I do not doubt, but that the places very remote from the mouths of the ureters, are always to be understood as being downwards only; even from considering the words that I just now copied; to which part not only the weight of the urine, descending through the ureters, urges, but the contraction of the bladder forces, the calculi.

In what manner, then, shall we explain the many other observations, of calculi of the bladder, included in a membrane, which Platner himself takes notice of in the same place? Were all these at the mouths of the ureters, or below them? And were they thus also, in the other observations besides these, that may be read in the Sepulchretum (*x*)? In one of Tulpus (*y*) in particular (for although there are many there from Tulpus, Platner did not refer to them all, but only to some one of them) in which nine and thirty calculi are describ'd in the bladder; "every one of which lay wrap'd up in its proper receptacle, and indeed so closely, that in the beginning, the surgeon was led to suppose no calculi to be contain'd therein?"

To this observation join another of Holtzappelius (*z*), which speaks of two and thirty calculi, "all included in their proper coats, and contiguous to each other; so that these calculi, each in its little cavity, fill'd up the whole concavity of the bladder; just as bees, in their small caverns, fill up the honey-comb; only a very small passage for the urine remaining."

Were all these, then, wrap'd up, in this manner, below the orifices of the ureters? And indeed it has sometimes come into my mind, as I have found (*a*) calculi within the biliary glands of the gall-bladder, to consider from thence, whether it is possible, that, through the orifices of the glands of the bladder, which, as I have sometimes found them open in the ureters, so also nothing forbids us supposing to be sometimes open in the bladder, which is but a continuation, as it were, of these canals; whether, I say, it is

(*p*) Traité des Hernies c. 31.

(*q*) Anthropogr. l. 2. c. 28.

(*r*) Diff. de Urin. c. 5.

(*s*) Disp. supra ad n. 27. cit. §. 13. & not. ibid. n.

(*t*) Mem. de l'Acad. R. des Sc. a. 1702.

(*u*) Dissert. qua obs. rar. Calcul. &c. §. 4.

(*x*) Sect. hac. 25. obs. 8. §. 7. 13. 14. & sect. 24. obs. 10. §. 1.

(*y*) Sect. 23. obs. 7. §. 1.

(*z*) Ibid. obs. 4. §. 2.

(*a*) Epist. 37. n. 29.

possible that through the orifices of these glands, very small pieces of sand may creep into the cavities of the glands, and there increase into calculi, which will be inherent in their alveoli.

But till I happen to light on a bladder, which has a calculus shut up, betwixt the coats, in such a place, as it could not possibly have come to, from the ureters; and have an opportunity of examining it very attentively; I shall choose rather to withhold my assent from this hypothesis of mine; and as I have learned from my observations, refer'd to above (*b*), that the orifices of the sacculi are often much less than the sacculi themselves, I shall also give some room for another conjecture; as, for instance, if a very small calculus having enter'd in, the orifice should from any cause whatever, be more streighten'd, and almost, or altogether, shut up.

But there are many sacculi, sometimes, in one bladder; and amongst these even small ones, which not only occupies the inferior, and middle parts, of the bladder, but the upper parts also: and this you will understand from those observations of mine; and still more clearly from two figures, which, as I have said in another place, the celebrated Heister has added to his Latin chirurgical institutions (*c*); and that with so much the more propriety, as it was a circumstance greatly to be wish'd, that they might not be altogether omitted, by any one of those who have written of Lithotomy, after frequent mention having been made of these sacculi.

32. For it is of great importance to the lithotomist, to have them always in his eye; as by these he may very easily be deceiv'd. And if Riolanus (*d*) has taught us, that the calculi, which have their nidusses in those lower sinusses of the bladder, "are not met with on the introduction of the catheter; and if the case describ'd by the celebrated Jo. Christoph. Mayo (*e*), shows the difficulty of taking out a calculus from those sinusses; it will naturally come into his mind, when considering a great number of sacculi, as existing in different parts of the bladder, how many cases may happen to him, in which; to omit the difficulties of the cure; he may be deceiv'd, even in the very article of searching for the stone.

And indeed from thence, as I see in the celebrated Schreiberus (*f*), the error has arisen of supposing a man to be cur'd of calculi, in whose bladder no longer any one offer'd itself to the catheter; whereas in the body of the same man, after death, were found nine calculi, which six sacculi of the bladder contain'd. But besides the deceptions of the lithotomist, in searching for the stone while this is, at one time, in the bladder, and at another time withdraws itself into a sacculus; which is a circumstance whereof I spoke pretty sufficiently above (*g*); it may moreover sometimes happen, to the great detriment of the patient, and of the reputation of the lithotomist, that the calculus, which was very evidently perceiv'd in the bladder, some days before, may in vain be sought after in the bladder now, that a section is made into that cavity.

(*b*) N. 30.

(*c*) Tab. 32. fig. 1 & 2.

(*d*) Loco indicat supra ad n. 30.

(*e*) *Commerc. Litter.* a. 1736. Hebd. 5.

n. 2.

(*f*) *Epist. ad Haller de Medicamento Stephens.*

(*g*) N. 10.

Wherefore in patients of this kind, in whom a calculus is sometimes felt by the catheter, and sometimes not felt, he who felt it before ought to prescribe many various kinds of motions, and postures, to the patient, if another lithotomist does not feel it at any time: and much more ought he himself to take care not to cut without feeling it, in the cavity of the bladder, at the very time of cutting. These circumstances however happen when the orifice of the sacculus is pretty large in proportion to the bulk of the calculus, as it was in our rustic.

But the orifice and sac both grow large, from the quantity and weight of the urine, to which the weight of the calculus must likewise be added; as this has the more matter to concrete round it, and increase it, in proportion to the quantity of urine that stagnates about it: and the more urine remains in the sac, in proportion as the calculus is increas'd; for by this increase the coats that compose the sacculus are more distracted: and their elastic, as well as muscular, force, whereby the expulsion of the urine would be help'd forwards, are greatly broken; and diminish'd.

Wherefore the sac may be, sometimes, increas'd to such a degree, in its magnitude, as to be mistaken for another bladder. But I do not say this, because I am ignorant that the bladder has been, sometimes, really double from its original formation; as I know that it has not only been three-fold, but even five-fold.

For it is certain, that Molinetti (*b*) has publicly demonstrated five in a woman, who was likewise supplied with as many kidneys, and six ureters; two of which were inserted into the larger bladder, and the four others into the four lesser bladders, into each one: which bladders discharg'd their urine into the larger bladder by peculiar tubuli; a very rare instance certainly, and perhaps the only one of the kind; and so much the more worthy to be taken notice of by me, in particular, as out of all those who refer to observations of a double, or triple bladder, that I remember to have read, the celebrated Fantonus (*i*) is the only one by whom the least mention is made, from Molinetti, of this quintuple, or five-fold bladder.

Nor does it escape me, that, from the first formation of the animal likewise, the cavity of the bladder is sometimes divided into two, by a kind of septum; whether that septum be plac'd longitudinally, or transversely: transversely Ruyfch (*k*) saw it in some sheep and calves, as Blasius (*l*) had seen it in the same animals, and, as I suppose, in the same manner: although the second cavity seems rather to belong to the dilated urachus than to the bladder; wherefore, as he himself hints (*m*), it is generally met with in quadrupeds only; and that which Blasius (*n*) once found in the human body, was very small: but longitudinally, as the same Blasius (*o*) saw in another man, in whom, however, he found, by an accurate dissection, that it was rather two bladders conglutinated into one, by the junction of their sides, than one divided by a septum.

Yet what kind of a septum that was, and how situated, which Bauhin (*p*)

(*b*) Dissert. anat. Pathol. l. 6. c. 7. in fine.

(*i*) Anat. Corp. Hum. Dissert. 7.

(*k*) Cent. obs. anat. Chir. 8. & Musæi Theca

A. Repos. 2. n. 1.

(*l*) Comment. in Synt. Vesling. c. 5.

(*m*) Obs. 8. modo cit.

(*n*) Part. 4. obs. Med. 18.

(*o*) Ibid. obs. 19.

(*p*) Theatr. anat. l. 1. c. 31. not. 2.

says was found in the body of a prince, does not appear clearly to me. This, however, appears, that what so many authors assert to have been found by Coiterus in the body of a virgin; whom I have had occasion to speak of already; none of them would have asserted, if they had read Coiterus a little more attentively.

For this author (*g*), without making the least mention of a septum, has, indeed, first said, that in this virgin, “he had found two urinary bladders; the one natural, and plac’d in its usual situation, the other proceeding from the neck of the matrix, on the right side; being almost twice as big as the natural bladder, very full of urine, and like the natural bladder furnish’d with two coats: yet that here no meatus was seen, either to bring in, or carry out the contain’d water.”

But below; where he says it may be inquir’d, “how this preternatural bladder was generated, and by what passages the urine enter’d into this appendiculated bladder;” he answers, “it was not surprizing, that in this virgin, who labour’d under a disorder of the uterus, and had her menstrual purgations, in a diseas’d and irregular manner, this thin and transparent water should be collect’d betwixt the membranes, which are found in great number, in the lower belly; and that this water, by expanding these membranes, as happens in other places, should have form’d to itself such a bladder, or reservoir;” so that it must be clear to every one, that he has not, in fact, describ’d a second urinary bladder; which had exist’d as congenial to the first formation of the animal; but a large hydatid, which had been, at length, generated by the force of disease.

How could it happen then, that Riolanus (*r*) should assert, that Coiterus had found a double bladder, in that virgin, “both of them being full of urine, but one only furnish’d with ureters, which discharg’d its portion of urine into the other?” Or even that Thomas Bartholin (*s*) should say, “that the bladder has now and then two cavities, distinguish’d from each other, by a membrane or septum; such as Volcherus Coiter found in a girl of five and thirty years of age.”

And if Tulpus (*t*) had not, soon after, follow’d him in repeating the story of this suppos’d septum of Coiterus; and Blasius (*u*) likewise, who expressly mentions Bartholin; the same mistake would not have run through such a number of other books, and those even the most modern, which it is by no means necessary to particularize here: and the desire of removing this error, has oblig’d me to be somewhat more full on the subject, than I intended. But I return to the matter in hand.

Where two or more urinary bladders, which communicate with one another, are met with, and yet, from the particular mode of structure, all of them do not seem to have exist’d from the original formation; as, for instance, if into any one of them no ureter opens, nor this one seems, in brute animals in particular, to be made up of the dilated urachus; this bladder, I say; especially if there is a calculus in it, or if a strangury, a dysury, or a frequent

(*g*) Obs. anat.

(*r*) Anthropogr. l. 2. c. 28.

(*s*) In Additis ad Patris Instit. anat. l. 1. c.

(*t*) L. 3. obs. Med. c. 5.

(*u*) Comment. cit. in Velling.

retention of a great quantity of urine, as frequently happens in drinkers, has preceded; is not to be consider'd as another bladder, but rather as a hernia of the natural bladder; that is a sacculus produc'd by the force of disease: such a one, for instance, as I suppose that to have been, which Bartholin asserts (*) had been seen in this theatre of ours, not by himself indeed, but by Moinichenius; being small, growing to the larger, and communicating therewith.

Yet, on the other hand, I shall somewhat more readily consider in the light of a double bladder; as one ureter, at least, open'd into each cavity; that which Stegmannus (y) describes in a young man, although labouring under a dysuria, an ischuria, and a calculus. And finally, before I make an end of speaking of these sacculi, I will also say, that those are to be attended to, which appear before the bladder is inflated; or which, if it is already inflated, cannot be imputed to a hiatus of the external coats of the bladder, that the knife has accidentally injur'd; through which hiatus, the internal coats, being forc'd outwardly, by the air that was blown in, resemble a sacculus; which however had no existence in the living body; and impose upon the incautious, or unexperienc'd anatomists: and this is a circumstance that we have sometimes observ'd to happen.

33. As to the remaining circumstance, that the coats of the bladder were become thicken'd, as we found them in the countryman (z) of whom I have hitherto spoken; so you might also have observ'd them to be in that country-girl (a), and in the young man (b), each of whom had been troubled with a very violent, obstinate, and long-continued difficulty of making water.

To these add the bladder, which the celebrated Dethardingius (c) took care to have represented in a plate; and even those which you will see in Ruysch (d), and which you will read, had their parietes thicken'd, from the same cause, to the extent of an inch; so that, in consequence of this thickness, in one of them, betwixt the parietes, and a large calculus, room was left only for a few drops of urine.

And this was also known to Riverius (e), who says, that in carcases of this kind, the thickness of these parietes has been found to be "equal to that of a finger, or thumb; so as sometimes to fill the whole cavity of the bladder, and be almost immediately in contact with the calculus itself." And not to lead you away from the Sepulchretum; although in that book (f) I also find these words taken from Riverius; you will even read that in a child (g) "they had been equal to the thickness of a finger's breadth;" and that, in another calculous patient (*), the bladder "had become externally fleshy;" which circumstance was likewise not unknown to Riverius, who (h), had remark'd the bladder to have become "a fleshy body."

(x) Anat. quart. Renovat. l. i. c. 20.

(y) Eph. n. c. dec. 3. a. 4. obs. 110.

(z) N. 28.

(a) N. 20.

(b) N. 15.

(c) Eph. n. c. dec. 3. a. 9. obs. 31.

(d) Cent. obs. Anat. Chir. 89. & Thef.

Anat. 2. Aff. 3. n. 5.

(e) Prax. Med. l. 14. c. 1.

(f) Sect. 28. hujus l. 3. obs. 19. & sect. 23. in schol. ad obs. 1. §. 8.

(g) §. eod.

(*) Ibid. §. 3.

(h) Obs. 19. cit.

But these circumstances do not happen only when the dysuria is from a calculus. For, not to say, that, in reading over one of the first observations of Hoffmann, refer'd to in the preceding letter (*i*), you will also find it to relate to the present subject; you have, at least, seen in the same letter (*k*), that when there was a dysuria from an excrescence of the prostate gland, the fibres of the bladder were so increas'd in their thickness, as to resemble the strong fasciculi of the heart; when examin'd by Valsalva; both in figure and magnitude: not to take notice, here, of the observation of Piccolhominus (*l*), which I am surpriz'd not to find transfer'd into the Sepulchretum; I mean that of a girl, who was afflicted with a continual fever, and very great pains, on account of an erosion and acrimony of humours; which, having depriv'd the bladder of its internal coat, had left "the fleshy fibres of the external so affected with inflammation, that you would have suppos'd the whole of it to be fleshy;" so far these fibres, says he, "are sometimes enlarg'd, and render'd conspicuous."

And with this you will join the observation of Rud. Jac. Camerarius (*m*), of a bladder "like to a fleshy mass," the parietes whereof being "of the thickness of two inches, the cavity was scarcely larger than a nutmeg," for that reason: and this you will be less surpriz'd at, when, in reading the history which I refer'd to above (*n*), from the *Acta Helvetica*, you shall observe that the coats of the bladder were of such an immense thickness, that, although the bladder itself was almost equal to the head of an infant, the cavity of it, nevertheless, was scarcely capable of admitting a nut.

And as I have just now said that the fibres of these coats are sometimes like the lacerti, or fasciculi, of the heart, I would not have you be ignorant that the same comparison was chosen by Valsalva; and not by him only, but by other observers after him also (*o*), who have lit on the like appearances.

Nor could you yourself, if you happen'd to light on a bladder such as the celebrated Trew (*p*) describes, and gives a figure of; which, having its internal coat consum'd, shew'd, instead of "the fibres of the muscular coat, various fasciculi collected together, in a surprizing manner, and distinguish'd from each other, by the intercession of large lacunæ;" you could not, I say, make use of any other comparison. And yet the bladder, whose substance was become thus thick, contain'd large and rough calculi.

But without calculi, as those of which I just now spoke, it was found by Hottinger (*q*), to be as thick as the little finger, when measur'd transversely; and to have fibres "very conspicuous, in consequence of their being enlarged to the size of a pretty thick cord:" and that on account of so great an acrimony of urine, that it excited "a very troublesome itching, in the hands" of the person who dissected the body: by Genselius also (*r*), it was found "thick" by reason of ulcers, and an excrescence in the prostate, confining the purulent urine: and finally by Bajerus (*s*); not to add others

(*i*) N. 12.

(*k*) N. 6. vid etiam. epist. 40. n. 4.

(*l*) L. 2. Anat. Prælect. 24.

(*m*) Eph. n. c. cent. 3. obs. 10.

(*n*) N. 23.

(*o*) Vid. apud Brendelium n. 2. Programm. supra ad n. 18. cit.

(*p*) Commenc. Litter. a. 1734. hebdom. 6. n. 5.

(*q*) Eph. n. c. dec. 3. a. 9. & 10. obs. 232.

(*r*) Eorund. cent. 6. obs. 84.

(*s*) Eorund. Act. tom. 3. obs. 122.

here; "of the thickness of a man's thumb," because it was internally ulcerous, and so irritated from hence, that, by its frequent contraction, constricting the mouths of the ureters, and causing the urine to stagnate therein at the same time, it dilated all the remaining part of them to the size of a man's thumb; and the *pelves* of the kidneys likewise, to an unusual size.

And that we, also, have more than once seen a thickness of coats in a bladder which was not affected with any calculus, you have not only been inform'd by the last latter (t), but from others also (u). For without doubt, whether, as in persons too much given to drinking, the urine very frequently solicits the bladder to discharge it; or any other cause, whatever, acts the part of a stimulus thereto; in so much the greater quantity does the blood flow to the bladder, and increase the thickness of the coats.

From other causes also, then, the coats of the bladder become thick: altho' much more frequently from a difficulty in making water. But, on the other hand, I suppose this difficulty to be increas'd by such a thickness; and sometimes to be produc'd, or preserv'd, as I shall show in a few words, after having subjoin'd an observation, which, if it could have been made perfect, would have been introduc'd in another letter, rather than in the present.

34. A sailor, who was fifty years of age, of a habit inclining to fatness, given to drinking, and accusom'd to make water with difficulty; and for that reason, perhaps, subject to a scrotal hernia; came into this hospital, on account of neither of these disorders; but on account of pain of the fauces, which, however, was not of such a kind as to prevent him from rising out of bed sometimes.

Having walk'd in the morning, therefore, through the hospital, and soon after gone to bed again, he was found dead therein; his face being black, though afterwards pale. The day after, the body, being still warm, was brought into the college, where I had begun to teach anatomy; it being about the end of January in the year 1733.

The belly being open'd in the manner I thought proper, the omentum was found to be drawn up above the stomach, and the neighbouring intestine colon: the liver was variegated, like a fine marble, with redish and whitish streaks; and was rather large: but the spleen was still larger in proportion, and yet not very large.

The kidneys and ureters were in a natural state; yet the bladder was enlarg'd, and had its coats much thicken'd. The urethra was quite free from marks of disorder in every part, although the corona glandis seem'd to have been formerly affected with little ulcers, at the termination of that and the preputium, from some cicatrices which remain'd. The hernial sac was seen in the scrotum, but was empty.

The trunk of the great artery was, in some measure, tortuous where it lay upon the vertebræ of the loins; as the trunk of its iliac branch, which had a bony hardness in some places, and whitish spots internally, was also: but the aorta had the spots only.

(t) N. 13.

(u) Epist. 4. n. 19. & epist. 10. n. 79.

In the thorax we found a heart very much enlarg'd. Therein the femilunar valves were in some places very hard; and the side of the anterior mitral was not without bone. And although from the vena cava, when cut into at the septum transversum, a great quantity of black and fluid blood had been discharg'd; yet in both the ventricles of the heart were polypous concretions, of a pretty firm compages, and of a white colour, internally, inclin'd to cineritious, of which, that on the right side, being the thickest, was produc'd far into the pulmonary artery; and the other into the aorta to no inconsiderable extent.

And the great artery; whose trunk seem'd to be universally wider than is natural, being distinguish'd here and there, on its internal surface, with whitish spots (such as I have spoken of) from the diaphragm quite to the heart; appear'd to be the more frequently sprinkled with these spots, the nearer it approach'd to the heart: so that where it is hollow'd out with the three lesser sinusses of Valsalva, it offer'd, to the view, spots that were much more evident, and would have been soon chang'd into bone.

Besides certain parts betwixt the heart and the curvature; which part extended more than three inches in length, and two in breadth; it was, likewise, internally unequal with thick, and almost tortuous, rugæ: nor were slight marks of erosion wanting. However, through the carotids the spots were not propagated; and much less the other disorders: so that I was the less displeas'd to find, that, while the accurate anatomical examination of these parts I have spoken of, as well as of the others, took up the space of some weeks, as they generally do; and while other parts were, in the intermediate time, brought in from other bodies; the head of this was buried without my knowledge: so that I could not inquire after the cause of the sudden death therein.

The pharynx, which had been taken off, and left behind, together with the larynx, I did however examine. And the larynx, as well as the whole aspera arteria, and the lungs, were found. I found the sides of the pharynx, of which I said the man had complain'd, to be thicker than natural: and by cutting into this thickness, I saw that it was owing to the substance of the pharynx itself; which being more distended, seem'd to resemble somewhat of a middle nature, as it were, betwixt glandular and viscid.

35. If you diligently attend to those circumstances that relate to the urinary parts, which are the only objects of our present consideration; you will certainly perceive that there was nothing, to which the difficulty of making water could be imputed, but the extreme thickness of the coats of the bladder. That, however, which is produc'd in the Sepulchretum, from Guarinoni, and in the additamenta to this twenty-fifth section (x), has not escap'd my notice: for its intention is to show that the thickness, of which we are speaking, "does not always prevent the discharge of the urine;" as is laid down in the argument prefix'd to that observation.

But besides that Guarinoni, if I rightly conceive of his opinion from a very few words, is not to be understood to refer to a dysuria, but an ischuria; which at length happens, when this thickness and hardness have come to their

highest pitch; I would also have you attend to this, that I do not suppose even a dysuria to be owing to every kind of hardness; as, for instance, when this arises only from the substance of the fleshy fibres being naturally enlarg'd, which renders them still more proper for contraction; but from that which not only enervates these fibres, by the interposition of foreign juices, but causes an infarction of all the remaining coats of the bladder to such a degree, as to render them less flexible; and, for that reason, makes them obstruct the contraction of the bladder.

And indeed, if you read over, out of the observations which are taken notice of above (y), those in particular, which I pointed out from Cameraarius, and the *Acta Helvetica*; you will clearly perceive that those very thick bladders, were either of a substance which was "fibrous" indeed, but "scirrhus;" or at least hard and callous: so that notwithstanding they were not all "every where agglutinated to the pelvis;" as that of Hottinger's was; yet they had much difficulty in contracting themselves: from whence finally those strainings, and endeavours in making water.

And these we may see from the same cause, frequently, even in calculous persons also; unless by reason of the weakness of the sphincter, the urine sometimes flows down spontaneously. So the bladder of the man whom Mauchartus (z) has describ'd, was "thick and almost callous." Thus, in a nobleman of Pistoia, the celebrated Targioni (a) saw the coats of the bladder an inch in thickness, callous, and full of steatomata; so that, as they could not be distended, they could contain only a very small quantity of urine, betwixt themselves and a large calculus.

And as a narrowness, and coarctation, of the bladder, are generally join'd with a thickness of the coats; as appears also from the example of Fantonus (b), taken from a man, who, after a long dysuria, from a calculus of the bladder, appear'd, upon dissection, to have the ureters very much enlarg'd indeed; but of the bladder itself, "by reason of the very great contraction, to "have a very small capacity;" hence it is, that, if they attempt to obtain a cure, they are often subject to more considerable uneasinesses, and dangers.

For the necessary motion of the catheter, when introduc'd, being by this means prevented; either the calculi cannot be properly inquir'd after (as is said by Laubius (c), in a man whose bladder was "very much constricted, "and thicken'd"); or if the surgeon make use of violence, the patient can by no means bear it; as we read in the work of the celebrated Schreiberus (d), in the case of another person, whose bladder, being "extremely constricted, had just accommodated itself to the size of the contain'd calculus, "and was much incrassated," so as to leave "no room" for the catheter to "turn itself in, when introduc'd.

And when the bladder is cut into, that may sometimes happen, which Schrockius saw (e) even in a dead body; I mean that "the bladder being "very thick, and constricted about the calculus, the calculus could scarcely "be mov'd from that place, and extracted from the pelvis." To this add, that if the bladder "has been rendered extremely narrow, from a calculus,"

(y) N. 33.

(z) Eph. n. c. cent. 7. obs. 15.

(a) Prima Raccolta di Osservaz. Med.

(b) De Observ. Med. & Anat. ep. 8. n. 15.

(c) Eph. n. c. cent. 8. obs. 22.

(d) Epist. supra ad n. 32 cit.

(e) Eph. n. c. cent. 10. obs. 100.

there is no room for the method of cure us'd by Foubert, without danger of a very considerable error, as the celebrated Kesselingius (*f*) has asserted; and as Aug. Fred. Pallas (*g*) has very well confirm'd: even when this method is assisted by a certain circumstance.

And this he also observes of Rau's method, even with the addition of a new instrument (*b*), and in the high apparatus, as they call it, he has expressly admonish'd us (*i*), that it is requisite the bladder should be "sound and large."

But what we have hitherto said of the great diminution, for the most part, of the capacity of the bladder; join'd with a thickness of the coats, and a difficulty of extension; is not only of importance to the lithotomist to consider, but greatly to the physician.

For, by way of example, if a person, subject to a dysuria, is seiz'd with a suppression of urine in the bladder; he will not easily suffer himself to be impos'd upon by the appearance of a small tension of the hypogastrium; as a surgeon I have already taken notice of did (*k*); so as to believe that it is not yet time to draw off the water by the catheter.

For from a slight, but very troublesome tension, in that part, he will conjecture that there is already as much urine in the bladder, as a narrow, and but little extendible, bladder of this kind can contain; especially if the patient be pretty far advanc'd in years, so that it may seem very probable for a hardness and rigidity, from old age, to be over and above added; and if, before the suppression, he had been accusom'd to make water very often, and but little at a time. I never repented of having been induc'd, by the consideration of these things, to accelerate the drawing off of the suppress'd urine in time.

36. Although this letter is already carried out to a great length, yet if we would comprize the other disorders, which relate to difficulty in discharging the urine, in the same letter; as I have promis'd in the beginning; we must, of course, touch upon many things in a cursory manner.

First then, to the other causes of this difficulty, whereof I have hitherto treated, those also must be added, which are to be met with in the urethra. That the prostate gland, which comprizes the beginning of this canal, may, by being indurated, and growing out into a preternatural size, not only render the discharge of the urine difficult, but totally obstruct it, has been shown in the preceding letter (*l*).

But when, from an ulcer and confin'd pus, this gland at the same time grows callous, and swells; it may sometimes happen, that, by the effusion of the pus, the internal surface may be decreas'd in its substance, and the swelling subside; and even that being eroded with ulcers, it may leave so much the more open a passage for the urine, because a callus, in the same manner as the scirrhus of the prostate, remark'd by the very excellent Haller (*m*), prevents the action of the sphincter in constringing the orifice of the bladder.

(*f*) Dissert. de Hist. & Meth. Foubert. n. 57.

(*g*) Dissert. de variis calculi. secandi Methodis §. 39.

(*b*) Ibid. §. 29.

(*i*) Ibid. §. 18.

(*k*) Epist. 41. n. 14.

(*l*) N. 13. 14. 17. & seq.

(*m*) Opusc. Pathol. obs. 35.

At this time therefore, a stillicidium of urine will be brought on; as in the observation of the celebrated Fantonus (*n*), which I think may be thus explain'd. But when the case is at one time as I have just describ'd, and at another time, the discharge of the new pus, from the prostate, is prevented; and from hence the internal surface of the gland again becomes tumid, below that upper callus; sometimes a stillicidium of urine will be the consequence, and sometimes a difficulty of discharging it: and this latter, frequently, will be so considerable, as to degenerate into a suppression full of danger; which danger will be the greater, if either the inflammation, or the hardness, and tumour, of this gland, forbid the use of the catheter.

These circumstances have not only occur'd to others, and sometimes to myself, in the practice of medicine; but had occur'd also to Valsalva, I see, in the case of a certain knight, for whom writing an opinion in the year 1714, he answer'd, that, if a suppression of this kind happen to be brought on; and it is not possible to open the natural passage for the urine; what had been propos'd by others was also approv'd by him: I mean that they should open a new passage, by forcing a proper instrument through the perinæum with dexterity.

And indeed, he moreover added, that if any thing should happen to forbid the performance of this operation; necessity then obliging us to attempt something; we might draw out the urine, by plunging in the trocar, us'd in the paracentesis of dropsical persons, immediately above the ossa pubis; and passing it obliquely downwards to the bladder: and this I was willing to observe, that you might also know, what he thought of both these methods of relief; if the urine cannot be drawn out in any other manner; so that the life of the patient may be, in the mean while, preserv'd, till art, or nature, shall open again the natural passage of the urine.

For as to the puncture in the hypogastrum; Weitbrecht (*o*) wrote to Goetzius, that it was "commended by some and blam'd by others," when perform'd in a certain soldier at Petersburg; and that he left it to be determin'd by the surgeons, "whether this method deserves blame, or praise and imitation:" but certainly, for ten days this operation had been of much advantage, till the other parts, and, among these, those also which had been the cause of the suppression of urine, were likewise the cause of death; the dissection showing the disorders of these parts, but not the least injury of those through which the instrument had pass'd; and consequently confirming the opinion of those excellent authors, who had before recommended it: though perhaps, at that time, they were not so well known in general.

But as to the puncture in perinæo; I suppose Valsalva was not ignorant, that his college, of Bologna, furnish'd him with an authority which he might follow; I mean Zecchius; who was formerly a very eminent physician, and who wrote upon the subject to Rota (*p*), in such a manner, as to show that he believ'd himself to be the inventor of that happy remedy.

And although Riolanus (*q*), where he commends that upper puncture, and this inferior section likewise; and this if there be necessity even at the side of

(*n*) Epist. supra ad n. 35. cit. 8. n. 18.

(*p*) Consult. Med. 58.

(*o*) Commerc. Litter. a. 1733, hebdom. 2. n. 1.

(*q*) Encheirid. anat. l. 2. c. 30.

the perinæum; in which he has his followers even now, who make use of the same instrument there, that they use in the hypogastrium; although, I say, he objects to Zecchius, that this remedy had been made use of "by the Parisian physicians, already, for a hundred years;" yet Zecchius, though he was a very young man a hundred years before, was nevertheless of such an age, that he might have learn'd it from nature herself; and by nature he says he was "taught;" when, "an abscess being ruptur'd" in the perinæum, in calculous persons, which abscess "had been spontaneously form'd there," he had seen "that all the pains, and disagreeable symptoms, in making water" were remov'd."

37. That answer of Valsalva, of which I spoke just now, is to a surgeon of Lombardy, who, consulting him in the patient's name, had also, among other things, inform'd him of this circumstance; which deserves to be taken notice of here; "that he remember'd to have found a stone in the prostate gland, when he dissected the body of his eminence the cardinal Morigi."

For this is the disease of which Christopher Pohlus treated, when he publish'd a dissertation, at Leipsic, in the year 1737, *De prostatico calculo affectis*; examining the disease with a laudable design certainly; from which, besides a dysuria, and a frequent stimulus to make water, other inconveniences may arise, and among these pains either in the affected part, or even in the whole urethra; in consequence of its not being sufficiently guarded against the acrimony of the urine, by reason of the quantity of inviscating humour in the prostate being much diminish'd, or the nature thereof vitiated.

It were to be wish'd that the old man (who had been a porter in his lifetime) in whom Pohlus found those calculi, had had none in the kidneys; and even had had these parts perfectly sound: and that there had been no considerable marks of inflammation; even in the lower part of the bladder itself, above the prostate gland; but particularly that no tumour, arising from the gland itself, had been internally prominent about that part, to the bigness of a cherry; and similar to a scirrhus, except that it abounded with pus.

That is to say, we are at liberty to doubt, whether all the signs of the disease, which Pohlus collected from the friends of the deceas'd, with great care and prudence, were the effects principally of those calculi: as you might, with very good reason, doubt, whether some of the symptoms describ'd above, by me, in Cortini (r), should be refer'd to that tartareous, and almost calculous matter, which was contain'd in a certain sinus within this gland.

And in another man; of whom mention will be made by me, on account of the peculiar and original constitution of the preputium and glans; when I found certain yellow, and small calculi, fix'd up pretty high in the prostate; I could not possibly learn, what inconveniences had been occasion'd to him therefrom: and that by reason of his being a foreigner, who had been taken into this hospital, on account of a very acute and fatal inflammation of the thorax.

This however I perceiv'd; that there could be no emission of semen by any means: as the calculi were situated, and fix'd, in such a manner, as intirely to prevent its discharge. And this observation brought to mind others

that I had read. For Marcellus Donatus (*s*) has said, that a man, in whose prostate he found a stone infix'd, "could not discharge semen, *in coitu*, except in a very small quantity, and very watery."

And Frederic Loffius (*t*) tells us, that the cause of sterility, or impotence, sometimes is "a calculus very closely shutting up that meatus, which opens from the prostate into the urethra." And among these authors it seems proper that we should reckon Nicolaus de Blegny (*u*); who relates that the ejaculation of the semen had been, in like manner, prevented, in another man, on account of the feminal caruncle being become tumid and hard; because the semen "had been there harden'd into a stone, and the vasa ejaculatoria were full of very hard stones," most of which were of the shape and size of a pea.

And Fabricius Bartholetus, who ought to have been mention'd before, observ'd, according to the relation of Rhodius (*x*), that, in the prostate, "a calculus had been generated from retain'd semen; and the orifice of the bladder being compress'd thereby, the urine was prevented from flowing down." But I wonder that Rhodius, and Bartholin (*y*), when taking notice of this observation, should, contrary to the custom of both of them, omit to mention that which I have, in the first place, pointed out from Donatus; not to say that I am surpriz'd they should omit another, which is in the same author Donatus (*z*), "of a very small stone," found in the prostate of a physician of Mantua.

And Terraneus (*a*) even relates, that he had observ'd, in an old man; "who was calculous in his kidneys, his spleen, and his lungs; small and unequal calculi in the tubuli of the prostate, and in those of the vasa deferentia which ejaculate the semen at the beginning of the urethra; which calculi caus'd uneasiness, and obstruction, both in respect of the urine, which was to fall from above, and of the semen when about to be discharged."

And before him James Douglass (*b*) has asserted, that he had found, in another old man, "some small hard bodies, similar to white peas; as to consistence corresponding with the body before mention'd" (that is to say, with one found in the tumour of a woman, which whether it was bony, or rather stony, or tartareous, he left undetermin'd) "but more polish'd, as to the external surface; some of which lay upon the very body of these glands" (that is the prostatæ) "while some adher'd, by small roots, to the membrane which cover'd these glands."

On these observations then, I was willing to take notice of to you here, not because they are not commonly enough known; for many of them are transfer'd into the Sepulchretum (*c*), although some in one place, and some in another; but that you may add them to the observations of Pohlius, and ours: although from none of them, a sufficiently peculiar sign can be drawn, in order to distinguish calculi of the prostate.

(*s*) De Medica Hist. Mirab. l. 4. c. 30.

(*t*) L. 1. Obs. Med. 33.

(*u*) Zodiac. Med. Gall. a. 2. Mart. obs. 4.

(*x*) Cent. 3. Obs. Med. 27.

(*y*) Cent. 4. Epist. Med. 6.

(*z*) C. 30. cit.

(*a*) De Gland. c. 5.

(*b*) Vid. Aët. Eradit. Lipf. a. 1707. m. Februar.

(*c*) L. 3. sect. 24. obs. 17. §. 4. & sect. 34. obs. 5. §. 4. & obs. 6. §. 1. & in additam obs. 3.

For, although in most of those which I have quoted, the ejaculation of the semen was prevented; yet this does not happen from every calculus of the prostate, nor from these alone: for neither are all of them in such a situation as to be able to obstruct, or compress, both the seminal ducts, nor does the obstruction, or compression, of these ducts, fail to be brought on, sometimes, by other causes.

But may we suppose these same calculi to be sometimes generated, among other matters, from that also which we very frequently meet with, under the appearance of granules of tobacco, within, or about, this gland, when we cannot suspect them to have been form'd of the seminal matter? You will be able to judge, of yourself, when I shall speak both of that matter, and of the sinusses that sometimes contain it, and of the other disorders of the prostate, in treating of the gonorrhœa (*d*).

38. In touching slightly, at present, upon some of the disorders, which are also common to the other parts of the urethra; I shall by no means repeat what has been said of calculi, which I have already (*e*) describ'd, as found under the internal membrane of this canal, in the body of a woman.

We shall rather say, what appearances have offer'd themselves to us, in the whole of the urethra (in so great a number of bodies, that we have dissected) which may relate to the controversy concerning the nature of caruncles; for so they are call'd; which almost every body formerly suppos'd to be generated therein, especially if a virulent gonorrhœa had preceded; though now this opinion is embrac'd by very few; and the difficulty of making water, as well as the obstructions the catheter meets with, and which they attributed to caruncles, have different causes assign'd for them at present by different persons; and among others cicatrices in particular, or turgid and varicose blood vessels, that cause a coarctation in some parts of the urethra; to which last kind the twenty-second of those observations, which are added to this twenty-fifth section of the Sepulchretum, likewise relates.

And even the corpus spongiosum urethræ itself, is said to protuberate within the cavity of this canal in that part; where the gonorrhœa has pretty much weaken'd some parts of the internal coat.

And as this coat is so thin, you will, I apprehend, be less surpriz'd, if it does, at any time, give way to the force of the blood, which distends the cells of that body; as the parietes of the corpora spongiosa penis, which are so much more thick and strong, are sometimes also rais'd up into a knot of that kind; as was formerly hinted even by Arantius (*f*).

The very experienc'd Goulard (*g*) thinks, that this kind of obstruction is more frequent in the urethra, than others; the existence of which however he does not deny; as it is more fitted, (which he demonstrates) to account for the phenomena; and among these, this likewise: how it happens, that, frequently, no obstacle occurs in the bodies of some persons after death, who have complain'd of them when living, even to the very day of their death.

That is to say, the cause which had forc'd these cells, ceasing in death; together with the power of the circulation of the blood; they are by degrees

(*d*) Epist. 44. n. 20. & seq.

(*e*) Epist. 33. n. 34.

(*f*) De Tumor. p. n. c. 50.

(*g*) Traité des Maladies de l'Urethra.

depleted, subside, and leave no traces behind, or at least none, that can strike the eyes of the anatomical inquirer.

Nevertheless, I believe that when they really did exist in the living body, they may be subjected to the eyes after death, if the spongy body of the urethra be distended by blowing-in air; in the same proportion as it had been distended in the living body by blood; and if the urethra be dried in this manner, and cut into: for then, without doubt, the place, within this canal, will come into view, where the obstacle us'd to be perceiv'd.

However, some are not wanting who still contend for the existence of caruncles, in the several parts of the urethra; but particularly would have them allow'd of in the feminal caruncles itself, when tumid: among whom also was Lancisi himself, in his letters to Genselius (*b*); but no body has treated the subject more accurately, and at large, than Benevoli (*i*), who has taught; not only by referring to (as the former author has done) but even by producing, the whole of his own observations; that this disease was in that same exulcerated caruncle.

Yet this author has not denied; which I would wish to have remark'd, by one and another very learned author, consider'd in other views; nay has even expressly confess'd (*k*), that there may be other obstacles in the urethra besides; some of which he also found from narrownesses, corrugations, and catrices; and even sometimes from a kind of fleshy excrescence: and he contends only for this one thing, that all those peculiar signs, by which he distinguish'd the disease whereof he was speaking, from other obstacles; which he was very well acquainted with, and which oppose themselves to the urine and the catheter; could not arise from these, as they did from the feminal caruncle when ulcerated.

And if others take pains to show that these may be better distinguish'd from each other, by certain marks; as he has done in regard to his; it is not to be doubted but this must be of great importance to the physician: as it is of great importance to make different predictions in different kinds of obstacles; and at the same time use a different kind of treatment; or at least to avoid improper methods.

You see that I, in a controversy which is in other respects abstruse, by reason of the observations being so very different; reject none of these, in conformity to the equity of Celsus, and the judgment of the most excellent men. "It is to be suppos'd," says Celsus (*l*); although speaking of another subject; "that every person has omitted what has not come under his knowledge; that no one has pretended to see what he has not seen."

And Astruc (*m*), Heister (*n*), and Platner (*o*), to whom you may also add Waltherus (*p*), do not doubt but there are different kinds of obstacles in different persons; nor do they suppose it of importance, whether every one has

(*b*) Eph. n. c. cent. 6. obs. 84.

(*i*) Nuova Proposiz. int. alla Carunc.

(*k*) C. 2. & c. 3.

(*l*) De Medic. l. 7. c. 14.

(*m*) De Morb. Vener. l. 3. c. 4. §. 4. & a-

(*n*) Instit. Chir. p. 2. §. 5. c. 38. n. 1.

(*o*) Instit. Chir. §. 1336.

(*p*) Dissert. de Collo Viril. Vescic. & cat. §. 15. & seq.

seen all these kinds: for it is enough that each of them is confirm'd by observations upon which we may depend.

Thus we readily admit of the caruncle which Genfeliuſ himself found (*q*); and not with leſs readineſs than we do of the ſtrictures, and coarctations of the urethra, ſeen by Brunnerus (*r*), and others. But I do not with equal readineſs allow of all thoſe, which each of theſe authors has added. Nor are they all of them obſervations, relating to this ſubject, but conjectures; I ſay even thoſe which are ſubjoin'd, as obſervations, by Genfeliuſ.

For what reference to this diſeaſe, have thoſe φύμαλα of the urethra, ſpoken of by Hippocrates (*s*), or “very ſmall abſceſſes”, as Celfuſ ſpeaks (*t*); which being ſuppurated ſoon, as generally happens, “health is reſtor'd,” immediately, upon the diſcharge of the puſ? Others, indeed, do relate thereto. But has not every one, who ſuppoſes himſelf to have cur'd a caruncle, at leaſt brought the ſame proof of his opinion, that Galen (*u*) produces; who having broken, with the catheter, a caruncle which “had ariſen from “an ulcer, ſaw not only ſome blood follow the excretion of the urine, but “alſo fragments of fleſh.”

Thoſe who have found caruncles exiſting in the body after death, which is the moſt certain method of obſerving them, are, when all taken together, much fewer in number, than Genfeliuſ ſeems to believe; if you ſet aſide thoſe, who, though they have ſeen fleſhy excreſcences in the urethra, yet have not ſeen them as form'd therein; which is the ſpecies we inquire after here; but have obſerv'd them to be hanging down from the bladder, from whence they aroſe, into the urethra.

And this being the ſtate of the queſtion, you will, I ſuppoſe, be leſs ſurpriz'd if I ſay, that, notwithstanding the great number of urethras, which I have attentively examin'd, ſince the time I firſt gave myſelf to the ſtudy of anatomy; and the number I ſtill inſpect every year; I have made but one certain obſervation of a fleſhy excreſcence; whereas I have many of cicatrices, and coarctations; and this one of excreſcence was not without theſe other ſpecies of diſeaſe.

39. A young man died of a wound in the head, in this hoſpital, about the middle of December in the year 1717.

The viſcera of the belly, the great artery, and the larynx; in the examination of which parts I was then wholly taken up; being firſt accurately inſpected, and demonſtrated to thoſe who were preſent; I found theſe preternatural appearances.

The ſtomach was enlarg'd, and had ſcarcely any rugæ. The liver was bigger than it naturally is; as the hepatic artery alſo was. The kidnies had many cicatrices: but the glans penis ſtill more; as it was become very much deform'd, and very ſmall, by reaſon of large cicatrices.

From thence, the urethra was very evidently much ſtreighten'd, quite to a third part of its length: nor did any of thoſe larger canals, that I have deſcrib'd in a former work (*x*), appear any where; but their place was, in general,

(*q*) Vid. obſ. 84. cit.

(*r*) Eph. n. c. cent. 1. obſ. 71. & 97.

(*s*) Sect. 4. aph. 82.

(*t*) L. 2. c. 8.

(*u*) De Loc. Aff. l. 1. c. 1.

(*x*) Adverſ. l. n. 10.

taken up by an interrupted line, which a thin excrescence of luxuriant flesh compos'd.

The other part of the canal; being cut open, quite to the bladder, and examin'd very attentively; show'd no mark of disease: as the larynx did not in like manner; if you except the epiglottis, which was not quite found. But the great artery was internally unequal, and had marks of beginning ossification, and corrosion; though somewhat obscure: besides, a little above the heart, it was become much wider than is natural.

40. I dissected the carcase of an old man; who was a foreigner, in the same place, and almost about the same time; the other of whose disorders I have not remark'd in my papers. That he had been infected with the venereal disease, as well as the young man of whom I spoke just now, the appearances, which I shall give you an account of, will sufficiently demonstrate.

For when the belly was open'd, and I had found one of the kidneys very large, the other more contracted than natural, and the ureter of this last almost universally dilated; to such a degree, as to admit the point of my little finger; and besides these, the bladder large, having its parietes thicken'd; and purulent; I turn'd my eyes to the urethra, and the penis. The glans penis was hollow'd out with many deep cicatrises: and the urethra was very much contracted, so that I was scarcely able to demonstrate, therein, one of those small canals, which are spoken of above.

The other parts did not seem to be preternaturally affected; except that the epiglottis was not perfectly found, and the nearest part of the tongue, which is cover'd with glands, was here and there disfigur'd with little ulcers.

41. As to the appearances which I observ'd in the urethra of both these persons; though it was easy to perceive from what cause they had arisen, yet it was not in our power to know what effects they had produc'd: that is, what inconveniences they had occasion'd in making water; as it likewise happen'd in regard to other appearances, which, being found by me in other urethras, by dissection, I have either given you the description of already, or shall give hereafter.

For I shall tell you (*y*), when I treat of the gonorrhœa (*z*), that, in a young man who died of a wound in the neck, I had met with an oblong whitish line, a little protuberant, going obliquely from the middle of the urethra, towards the farther part of that canal; as I also met with some other little chords in an asthmatic man (*a*), not without a contraction of the urethra.

And I said in the fortieth letter (*b*), that in an old man, who had been taken off by the rupture of an aneurism, I found the urethra cicatriz'd in several places; and fibres, besides, obliquely prominent, betwixt the seminal caruncle, and the bladder: and in like manner in the fourth letter (*c*), that in the stable-keeper, who died apoplectic, I met with oblong whitish lines, obliquely prominent, in two places of the urethra; and in one, at least, oppos-

(*y*) Vid. etiam epist. 63. n. 13.

(*z*) Epist. 44. n. 7.

(*a*) Ibid. n. 10.

(*b*) N. 29.

(*c*) N. 19.

ing themselves to the probe when introduc'd: and finally, in the tenth letter I have said (*d*), that in the body of a paralytic man, who had been taken off by convulsions, I likewise found certain oblique, and almost fleshy, fibrillæ, in that part of the urethra, where some obstacle used to lie in the way of the catheter.

Now if with that line, which I said, just now (*e*), was made up of a thin excrescence of luxuriant flesh, you compare these almost fleshy fibrillæ, and those fibres; and with both of these, in like manner, compare the oblique and prominent lines; you will perhaps suspect, with me, that a kind of thin excrescences do now and then succeed to some certain erosions of the urethra, which excrescences, when contracted, first resemble fibres, or fleshy fibrillæ; but when more and more dried, do, at length, put on the appearance of whitish and somewhat prominent lines: and therefore it must have happen'd to me, to have seen excrescences of this kind frequently, if I could have inspected these urethras, while the disorder was more recent. Yet, on the other hand, it is not absurd, to suppose, that as I have more than once seen the urethra cicatriz'd, and very manifestly streighten'd; so these lines may be, in some measure, the consequence of those appearances.

42. I have frequently dissected, and accurately examin'd, the urethras of women also; though not so frequently as those of men. But hitherto I have not lit on any one (unless you would perhaps except one, whereof I shall speak presently) which had cicatrices, and much less excrescences: nor is it to be wonder'd at, in a very short, and not very narrow canal, into which neither so many humours, that have the power of eroding, are discharg'd, nor does any flexure happen therein, and still less so much as is observ'd in the male urethra. Yet that in the female urethra, both ulcers and excrescence, or at least some long-continu'd obstacles, may arise, I have learn'd from Astruc and Alghisi; the former of whom (*f*) has more than once seen the body, with which the female urethra is surrounded, suppurated, and fistulous, opening within the urethra, and discharging pus; and, at other times, that the urethra was immoderately streighten'd by the same tumid and callous body; and Alghisi (*g*) mentions a virgin, in whom a thin medicated candle, that had been left within the urethra; in order to destroy "a carnosity" of that canal; had enter'd into the bladder.

Add to these the "fleshy excrescence," which will be spoken of presently, describ'd in a certain widow, by Mullerus (*h*).

And it happen'd once to me, when I examin'd the body of an old woman, about the beginning of the year 1751, that I met with a small triangular excrescence, within the external orifice of the urethra, yet not protuberant therefrom: and very often, but particularly after acute fevers, I have observ'd sanguiferous vessels; which being in great number, and almost parallel, creep through the internal coat of the urethra; and these so turgid, and crowded together, that almost the whole of this canal was black therefrom: and it happen'd once in a young virgin, and, in like manner, in an old woman, of whom I shall perhaps have occasion to speak hereafter (*i*),

(*d*) N. 13.

(*e*) N. 39.

(*f*) §. 4. *supra* ad n. 38. cit.

(*g*) Litotom. c. 3.

(*h*) Eph. n. c. cent. 8. obs. 38.

(*i*) Vid. *epist.* 50. n. 51. & *epist.* 56. n. 21. that

that I saw a portion of this same coat prolaps'd on the outside of the orifice of this meatus.

But what inconvenience these last-mention'd females, or the former, suffer'd in the discharge of their urine, I could conjecture indeed, but not for a certainty know.

In regard to the cause likewise, why some part of that membrane was so prominent, from the orifice of the urethra; in the two last spoken of; we were only at liberty to conjecture it.

And as I was not willing to make use of that conjecture, which might have been drawn from this orifice, and that membrane, having been frequently irritated by the head of a needle (*k*), or bodkin; another perhaps remain'd to be drawn from a foregoing strangury.

For that this membrane is urg'd downwards, by very violent strainings to expel the urine, is not only hinted by reason, but confirm'd by the observation of Mullerus, that I have already quoted. For the excrescence, which, coming forth out of the orifice of the urethra, had stop'd it up, being in great measure consum'd; the remaining internal part became "conspicuous only by that kind of straining, which we use in unloading the bladder."

Which observation of an excrescence, that was "fleshy, red, and fungous; and had come forth to the size of a bean," from that orifice; if it be join'd, by you, with another instance, which the celebrated Goulardus (*l*) mentions, of a "carinosity in the urethra" of a certain man, which grew out to such a degree at some times, that it came forth from the orifice thereof, and was there to be taken off; you will so much the more readily join in opinion with those, who still acknowledge caruncles, among the other obstacles, that occur in the meatus urinarius.

But not to depart from the consideration of the female urethra; what shall we say of that very rare observation of Corn. Solingen, which Salzmannus (*m*) takes notice of; I mean "of the meatus urinarius being inverted, and hanging downwards, to the length of a little finger?"

Shall we say that the membrane of the meatus was relax'd, and extended, to such a degree? Or that the neck, or lower part, of the bladder, was fallen down thither, as Salzmannus (*n*) seems to believe? Who nevertheless proposes the following doubt (*o*): "if some other part, which offer'd itself to the eyes, did really not impose upon Solingen, under the appearance of the bladder."

There is also another disease, to show the rarity of which in the female urethra, I shall hint at a few things concerning this canal; and calculi discharg'd thereby. The urethra of females, as Celsus (*p*) says, and, as I just now laid down, "is both shorter, and more lax, than in males;" and, as he had said above (*q*), is, at the same time, more direct in its passage."

A calculus therefore, as the same author very properly subjoins, "when it is very small, frequently falls out of itself." And sometimes stones, that are by no means small, are spontaneously extruded this way; of which

(*k*) Supra n. 19. & seq.

(*l*) Tract. supra aa n. 38: cit.

(*m*) Dissert. de Hern. Vesic. Urin. thes. 18.

(*n*) Thef. 26.

(*o*) Thef. 19.

(*p*) De Medic. l. 7, c. 26, n4.

(*q*) Eod. c. n. 1.

kind was that I saw here, as I have already written (*r*); and still more those that I saw at Bologna. Of which, or others; that Langelottus (*s*), Jægerschmidius (*t*), Dillenius (*u*), Schmiederus (*x*), Trew (*y*), and others, have spoken of, as being extruded from the female urethra, without the assistance of surgery; it is of no importance to say more: since it is certain that Sennerthus (*z*), and Tulpius (*a*), have seen larger than those; that is, the former one “almost of the bigness of a hen’s egg,” and the latter one, as the figure “which is added shows, very thick, and weighing three ounces, and two drachms.”

And this I believe to have been the largest, among all of which I remember to have read: I say among all, not only that have been discharg’d by women, but even generated in their bladders; whereas I know, that, in the male bladder, they have grown to an immense weight.

For I omit that which “weigh’d an English pound, and two drachms besides, the like to which” Van Helmont “did not remember ever to have seen;” since in the same section of the Sepulchretum (*b*), wherein those words are related, calculi of thirty-two (*c*), and thirty-four ounces, in weight, are describ’d (*d*): and the celebrated Targioni (*e*) asserts, that there is one at Florence, which weighs thirty-nine ounces; and this is, likewise, the more remarkable, because it was found in a man, who was carried off by a disease; after a healthy and flourishing old age; in which there were slight suspicions of a calculous disorder, rather than any real or true symptoms.

And I see that another of the same weight is taken notice of by Verducus (*f*), and from Launayus (*g*) another of fifty-one ounces: finally, that your wonder may be carried quite to its height, consider that which Kesselingius (*h*) says he had seen in the possession of the celebrated Morand, “equal “in weight to six pounds and three ounces:” which very weight; lest you should suspect me of having made a mistake in the description; you will also find in the reviewal of that dissertation, publish’d in the *Commercium Litterarium* (*i*).

But from what cause do you suppose it to happen, that we read of no such large stones being found in the female bladder? Doubtless, I either am deceiv’d, or the more direct, and shorter passage, of the urine in the female sex, as I have already said, and particularly the wider passage, easily receives and emits the much greater part of that viscid, and tartareous matter; which, by reason of contrary causes, stagnates in the bladder of the males, and is continually added to the matter already concreted into a calculus; whereby its bulk is greatly increas’d: and this happens particularly in some bodies, who are most dispos’d thereto.

(*r*) N. 10.

(*s*) Eph. n. c. dec. 1. a. 6 & 7. obs. 7.

(*t*) Dec. 3. a. 3. obs. 101.

(*u*) Dec. ead. a. 9 & 10. obs. 242.

(*x*) Cent. 3 & 4. obs. 161.

(*y*) *Commerc. Litter.* a. 1733. hebd. 39.

n. 4.

(*z*) *Med. pract.* 1. 3. p. 8. f. 1. c. 2. vers. fin.

(*a*) *Obs. Med.* 1. 3. c. 7.

(*b*) 23. obs. 1. §. 9.

(*c*) *Obs. ead.* §. 1.

(*d*) *Ibid.* §. 2.

(*e*) *Prima Raccolta di Osservaz. Med.*

(*f*) *Vid. apud Boretium de operat. alti adparat.*

(*g*) *Vid. apud Pall. differt. supra ad n. 35. cit. in adnot. ad §. 19.*

(*h*) *Differt. ibid. supra cit. n. 53.*

(*i*) A. 1739. hebd. 9.

For which reason we ought to consider as the more extraordinary, the case publish'd by the celebrated Adolphus (*k*), "of an oblong calculus form'd in "the urethra" of an old woman, "and firmly adhering thereto."

For by what means could the particles, of which this calculus consisted, remain in a canal of that kind, and not be carried away by the impetus of the urine?

Certainly, either the impelling force, by which the urine is driven, was grown very languid, in a woman of threescore and sixteen years of age, or the membrane of the urethra was, in some places, ulcerous; and for that reason retain'd those particles within its winding sinusses, and inequalities: or, finally, the calculus which was first generated in the bladder, and had, in some part, enter'd into the urethra, having been obstructed there, had fresh and fresh additions continually made to it, of the same kind of particles flowing that way gently, and almost drop by drop, as is generally the case; these things, I say, either all, or some, might be sufficient to produce that which is the object of our surprize, though the production is nevertheless very extraordinary.

And what favours this explication, besides the age of the woman, is the preceding "obstruction of urine, for many years, at times at least; but "particularly the calculus itself bent back quite into the bladder. For see my first observation (*l*), of the calculus which had been form'd upon a needle, within the bladder of the virgin.

This calculus, as it had a part of itself bent back within the meatus urinaris, certainly had not begun from that part; but on the needle, which was at some distance from thence: and this very part had been gradually form'd, within the contiguous meatus, as an appendix and additamentum of the calculus; so that it was evidently to be consider'd as the end, and not the beginning, of the calculus.

43. It would remain now, that I should write of the Diabetes, of the incontinence of urine, of its excretion through an indecent place, and of urines that are not in their natural state; each of which subjects has a peculiar section allotted to it in the Sepulchretum.

However, I shall not do this for two reasons. The first is, that neither Valsalva, nor I, have dissected any one who died of a diabetes; as you may, of yourself, easily conjecture, from what I hinted of this disease, in the former letter (*m*). The second is, because I have already describ'd all the appearances I have met with, in those who died after the other disorders, which are just now spoken of; and that at the same time I treated of different diseases, on which they depended: as you may have observ'd even in this very letter. And it is not our custom to repeat any thing.

But if this were not done in the Sepulchretum, those sections, that I have spoken of, would be reduc'd so as to contain much less; notwithstanding the two first are so short, that both of them, together with the Scholia, scarcely fill six pages. Besides, in almost every one which relates to the urine, or the parts subservient thereto, not only the observations which had been

(*k*) Act. n. c. tom. 1. obs. 239.

(*m*) N. 14. 15.

(*l*) Supra ad n. 19.

given in other sections, are repeated, but they are set down twice even in the same section.

You have learn'd already, from the beginning of the preceding letter (*n*), how many were repeated in the twenty-fourth section. See then, I beseech you, whether in the twenty-third section, which precedes that, the things whereof we read in the first article of the eighth observation, are not the same that we read partly in the ninth observation, and partly in the Scholia which are subjoin'd to it: and in the section, on the subject of which I am still employ'd, that is the twenty-fifth, whether what had been given under article the second, and tenth, of the eighth observation, are not set down again under article the nineteenth, and article the seventeenth, of the same observation.

But even in one of those very short sections, that is in the twenty-seventh, is not what is said under article the third of the first observation, the same that is said under article the ninth of the second? And in this very second observation, is not article the fourth the same with article the eleventh which follows? If you are inclin'd to doubt it, only examine the histories, as they are related at large, in the twenty-fourth section, observation the tenth, article the eighth, and observation the second, article the fourth; on reading of which all your doubts will be remov'd.

Finally; not to take up your time with too many strictures; if you turn over the twenty-seventh section, you will find, not without great surprize, that the very same things which have been said a little above, are twice repeated below, in one and the same page; that is to say, first the greatest part of the Scholia to the sixth and seventh observations; and after that, under the twelfth observation, the history of the illustrious dutchefs, article the second and fourth.

44. Yet, lest we should seem to pass by these sections, without taking any notice of them, I will remark a few things, in regard to that last, which relates to urine in a preternatural state; and not much more, in regard to the last but one; which I have said relates to the excretion of urine through an indecent place. For both these kinds of remarks may not be without their utility; though they will have no dissection join'd with them.

I have sometimes lit on urine which seem'd to have chyle mix'd with it, and sometimes on that which seem'd to have blood; so that some physicians contended that the circumstance was to be consider'd just as it appear'd; but others that it was to be understood very differently.

That first controversy was agitated here about forty years ago, to a very great degree; when the last of the noble family of the Discalcis; in that long-disease of which he at length died; continu'd to discharge urine, for a long time, the greater part of which seem'd to be perfectly like milk.

One of his physicians; a very eminent man, who was join'd with me in the office of professorship in the college, and was my intimate friend; having observ'd that sediment to be quite free from smell and viscidty, asserted it to be chyle. The other denied this, and contended for its being pus.

In order to settle this long and obstinate dispute, every one, at Padua,

who had then any name in phyfic, was sent for, at different times. As there is nothing that I choofe more to avoid than to be engag'd in controverfy, I had long evaded it, by many and divers excufes: but I was, at length, perfuaded to give my opinion, by the patient's wife's brother, Alexander Guarini, in whom that ancient family, made illuftrious by the eminent poet of his name, likewife became extinc't, after fome years.

When I had heard the reasonings of the contending parties, had examin'd the urine, and had diligently examin'd the patient; I answer'd in fuch a manner, as to fhew to every body, that I did not fet light by either of the difputants; but gave to each his merits: yet as I ow'd more to the love of truth than to friendship, I was under a neceffity of inclining to the fecond opinion.

For that chyle might, indeed, be difcharg'd by the kidnies, I faid I was not ignorant; provided the fecretory paffages, through thefe vifcera, are very lax (and we muft of courfe explain fome of thofe examples which are pointed out even in this twenty-feventh fection of the Sepulchretum (o) in this manner.)

However, in our patient, from the fymptoms of an injury in one kidney; which had long preceded (and thefe pretty confiderable) and even then attended the difcharge; it feem'd that pus could not be excluded, though a part of the chyle may join itfelf thereto. Nor did it efcape me, how foetid a pus is, fometimes, difcharg'd from difeas'd kidnies; yet there are examples of pus without any fmell, not only from other parts; as when Celfus has faid (p) "that pus is beft when it has no fmell;" but even from the kidnies themfelves, and for that reafon to be taken notice of juft now.

For as to the fediment not being vifcid, that very vifcid fubftances are fometimes found in the kidnies alfo (as in the fame fection of the Sepulchretum (q)). Neverthelefs that all pus was not vifcid; and the pus which is difcharg'd with the urine, in a glutinous and thin ftate, I have read that the moft experienc'd phyficians (r), attribute to the bladder, and not to the kidnies: and that Valfalva alfo, taught by diffection, had been accuftom'd to deduce this much more feldom from the kidnies, than from the parts beneath.

And though we fhould pay no regard to thefe arguments, yet I could not forget either that man, or the bifhop, whofe hiftories; that have been left us by Benedictus Silvaticus (s) and Lælius a Fonte (t); are as fimilar to ours, as we can fuppofe (fo that, for this reafon, I could fcarcely believe, that thefe hiftories, in a controverfy fo warmly agitated, had been taken notice of by no body, before me; as I was afterwards certainly inform'd.

For in both of thefe patients, figns of a difeafe in one kidney had preceded; and even had been attended, as in ours, with a flow fever, and a wafing of flefh. By both of thefe patients urine was difcharg'd, the fediment of which was not foetid, nor vifcid, but inodorous and fluid; and much like milk. That this was pus flowing down from the kidnies, both of thefe phyficians affirm'd. Others denied it; and particularly in the cafe of the bifhop.

(o) Schol. 2. ad obf. 14.

(p) De Medic. I. 5. c. 20. n. 20.

(q) Obf. 9. §. 1. & obf. 22. §. 1.

(r) Vid. ibid. Schol. ad obf. 10 & 15.

(s) (t) Vid. ibid. cit. obf. 10. cum Schol. & obf. 14. cum Schol.

But the dissections which shew'd the substance of his kidney to be consum'd, or perforated, by an abscess, stood as a testimony of the case. From these things; though I said them more like a person who was making remarks, than like one who pronounc'd upon a disease; although I inculcated the difficulty of judgment in determining the hidden seats and nature of diseases; and though I did not profess to be more learned and sagacious than the many others, who had been consulted on the former days; yet it was no secret to any one of the noble and learned men, who were present in great number, to which side my opinion was inclin'd.

Nor was the dissection of the body refus'd, soon after, when the patient died; by which; although it was perform'd, almost clandestinely, by a surgeon of no note or eminence; it was pretty well known, nevertheless, afterwards, in spite of this caution, that the kidney, of the affected side, was found to be half putrid, and reduc'd to a very small bulk.

And although this report was confirm'd by the silence of those, to whose credit it was to have it believ'd otherwise; yet as neither I, nor any one of my friends, was present at the dissection, I did not think proper to lay it down here as certain.

45. This controversy was at Padua. But at Venice there was formerly another controversy, in which fewer persons were concern'd: the dispute was whether the urine of a certain abbot had blood really mix'd with it, as it seem'd to have, or not. The affair was almost like that which is describ'd in the same twenty-eighth section of the *Sepulchretum* (u); for the blood did not subside in the urine, even after being long kept.

When I was consulted, I persuaded them to make the experiment by applying fire; for by this means the blood might easily coalesce, and show itself, if it was really therein. Wherefore, by making this experiment, the controversy was at once put an end to.

However, in what manner the celebrated Burgmann (x) made the same inquiry, by immersing a white linen rag into the urine of this kind; and what Schelhamer (y) found instead of blood, and by what means he found it; and how in some persons blood is to be accounted for, from the hæmorrhoids of the bladder, according to Cælius Aurelianus (z); although I gave an answer, at large, upon this subject, to the celebrated Serao, who consulted me for a noble Neapolitan patient, in regard to whose case there was a great dissection of physicians; yet I will not take up your time now in discussing these things: but will rather exhort you to examine the authors I have commended; and to read the very learned Helwichius (*) upon the subject of these hæmorrhoids.

But when you shall read, in the same section I just now pointed out (**), that round, vermiform, and bloody bodies had been discharg'd, together with the urine, by a certain widow who suffer'd a most excruciating pain in the loins; you will require a more accurate examination of their substance, by which it might appear that they were polypous concretions, thus form'd in the ureter,

(u) Obs. 9.

(x) *Commerc. Litter. a.* 1733. hebd. 36.

(y) *Eph. n. c. dec. 3. a. 9.* obs. 81.

(z) *Morbor. Chron. l. 5. c. 4.*

(*) *Eph. n. c. tom. modo cit. obs. 119.*

(**) Obs. 26.

rather than round particles of the kidney, which had been corroded by a cancer.

For that they were not true worms even the author of the observation has acknowledged : which certainly cannot be discharg'd together with the urine, unless a passage be open'd betwixt the bladder, or the urethra, and the intestines ; as I have already shown above (a).

Wherefore, when you come to the thirtieth observation of the same section; in which it is said that grapes, pieces of lettuce, and other kinds of food, were discharg'd together with the urine ; you will partly wish for a greater caution, and a more accurate examination : and, as in one, the whole bladder is said to have been ulcerated, you will also partly suspect, that an ulcer had reach'd from thence into some one, or other, of the intestines.

For it might easily happen, that a bladder, in this state, should coalesce with one of the nearest intestines ; and that thus a winding sinus might be form'd, by means of a kind of ulcerous corrosion, from the one to the other. And in this manner, we may perhaps conceive how the man of whom Young (b) writes, discharg'd, together with a fœculent urine, very small grapes, and particles of leaves, and roots, and other things which he had eaten ; and with these two pills drawn out into a considerable length.

It is certain that very severe colic pains had preceded in the former months ; so as to make it not altogether improbable, that some inflam'd intestine had coalesc'd with the bladder, and a small abscess being made, that pus had been discharg'd into the cavity of both these viscera, by which a fistula of communication might have been left open betwixt them.

For as to the urine having no disagreeable smell, when Young was call'd to the patient ; and as to neither blood, nor pus, being discharg'd in the stools ; as to there being no tenesmus ; and as to the unctuous fluid, given in the form of a glyster, not having ting'd the urine with its colour ; it is true that these circumstances might, with good reason, render it less supposable, with him, that there was a communication betwixt the bladder and the rectum, or betwixt the bladder and the colon.

Yet he would, perhaps, have thought it more probable, if he had conceiv'd of this communication, betwixt the bladder, and some part of the intestine ileum, contiguous thereto : for those very severe pains which had preceded, although they were call'd *Colic*, might possibly have been *Iliac*.

46. But a preternatural foramen ; which goes from the bladder to the contiguous intestinum rectum ; as it renders the explication of urine discharg'd by the anus very obvious ; so it is sometimes either so obscure in dead bodies, or so difficult to be believ'd in the living, that it is but just possible, and indeed scarcely at all possible, to explain this case, (which relates, as you see, to the last but one of the sections enumerated (c)) in the same manner, with any degree of probability.

All these things that I say I shall illustrate by examples. The most ancient of which is from Praxagoras, who relates, “ that he saw a certain man, who “ had excreted his urine per anum, and had surviv'd twelve years : but whe-

(a) N. 6 & 29.

(c) Supra n. 43.

(b) Vid. apud Th. Dereham Saggio delle
Trasf. tom. 3. p. 2. c. 4. §. 29.

“ther more years or not (as he himself had at that time departed, and had not heard any thing of him afterwards) he was quite uninform’d.”

This passage I have copied from the little book of Ruffus Ephesius, *de Verificæ Renumque Affectibus* (*d*), in the same manner as we read it in the edition of Henricus Stephanus, of *Medicæ Artis Principes*; which little book Linden, and Mercklin (*e*), do not seem to have observ’d to be extant in a Latin translation.

And these things I was willing you should know, lest you should, perhaps, wonder why I have not said, as Schenck (*f*), and those who copy him, have done, that Praxagoras had seen a certain person “in whom the urine “was discharg’d per anum for twelve years together.”

Yet if he had really asserted this, as expressly as he has said that the man survived twelve years, there would be no great cause for wonder; since even in this twenty-seventh section (*g*), we have the history of a man, who, from his childhood to his fortieth, and even quite to his fiftieth year, “always” discharg’d his urine by the anus: for a lithotomist, having cut out a calculus from him, when a boy, had so far injur’d the bladder and intestinum rectum, that after death a passage was found to go down from the bladder, into this intestine, “of the width of an inch.”

And what the unskilfulness of the operator had given rise to in this man, seems in the man observ’d by Praxagoras, to have been the effect of disease; for, after those things, Ruffus subjoins his observation, that “sometimes an “abscess bursts into the intestine;” although, to dissemble nothing, he speaks of an abscess of the kidneys: but you know that Pechlinus (*h*), when urine was excreted from the intestines, five or six times every day; in a man labouring under an ischuria of the kidneys, and a calculus of the bladder; left it quite undetermin’d, whether this urine “was brought, from the bladder, “by new, and tubulated passages, into the intestinum rectum, which lies “immediately under it; or from the kidneys to the intestines.”

However, Fernelius (*i*) speaks of an abscess of the bladder, and of the intestinum rectum; when he says that this abscess has been “sometimes seen “to penetrate, even to the anus; and the urine to flow out that way.” And Hildanus (*k*); when, after a long ischuria of the bladder, and purulent urines, he had at length seen this fluid, on the last twenty days of the patient’s life, no more discharg’d by the penis, but by the anus; “at one time “by itself, and at another time mix’d with excrements;” found that a small, and round, ulcer was carried, from the cavity of the bladder, into the intestinum rectum.

Wherefore, when Horstius had related to him, that a woman; who, in falling from a tree, had got a laceration of the genital parts, and imprudently heal’d up the external wound soon after, “had now discharg’d no urine for more than “the space of a fortnight,” except that “a serous humidity flow’d every day “from the intestines, not together with the intestinal excrements, but sepa-

(*d*) C. 8.

(*e*) Linden. Renov. vide Ruffus.

(*f*) Obs. Med. l. 3. ubi de Urina alien. loc. excreta, obs. 13.

(*g*) Obs. 1.

(*h*) Vid. Aët. Erud. Lipf. a. 1691. M. Maj.

(*i*) Pathol. l. 6. c. 13.

(*k*) Cent. 2. obs. 65.

“rately;

“rately;” he made no doubt to pronounce (*l*), “that he was firmly persuaded, not only that the neck of the bladder, and uterus, but even the intestinum rectum itself, had been injur’d, and perforated, by the tree.

And thus far, indeed, the explication is easy and clear; as it had also been in a nobleman, if the blood which he discharg’d from his intestines, had not, without doubt, conceal’d the urine that was mix’d therewith: for in him the celebrated Moraschius (*m*) found a calculus of the bladder, adhering to a fungous flesh, which calculus had, at length, perforated the bladder, together with the intestinum rectum.

But, on the contrary, there are observations, in regard to which you may hesitate; as that, for instance, which is pointed out from the *Acta Helvetica* (*n*), more than once, above; though with a different view. For although, to a discharge of bloody urine, and a dysuria, this symptom of making water per anum was added, a little before the end of life; yet the bladder shew’d no ulcer, and no passage which led to the intestine.

Add to this, an observation from the Sepulchretum (*o*), of a much longer time. For a boy; in whom, “through the whole space of ten years, the urine was intirely suppress’d, some drops of which, though not very limpid, came forth per anum;” had his kidneys, and ureters, render’d uselefs, by the force of disease: but the bladder “not at all preternaturally perforated.”

And indeed, where there was a great quantity of urine in the bladder (as in him of whom Rhodius (*p*) speaks) being suppress’d by a caruncle of the urethra; this urine “flow’d, in its clear state, through the intestinum rectum:” but only “till, the obstruction being removed, nature return’d to her usual passage;” so that we do not at all conceive, how it had quite ceas’d to flow by the intestine, if a passage were really open’d in a preternatural manner, from the bladder to that intestine.

There was, likewise, a great quantity of urine, in the bladder of a child, whom many take notice of from the observation of Benivenius (*q*); for he had discharg’d none for seven days; when he at length evacuated it by the anus. But lest you should suppose, that some remaining mark of preternatural perforation, might possibly be overlook’d by Rhodius, and by Benivenius; read over the observation of the celebrated Reusnerus (*r*), on another child.

You will, at least, see that there was no urine in the bladder, which could make its way, by force, from thence into the intestine: and yet that, on the seventh day of the ischuria renalis, “urine, which was similar to what is naturally excreted, in colour, smell, and quantity, was discharg’d from the intestines, without any discharge of the intestinal fæces at the same time;” “without any pain, or alteration:” and that three or four times a day, for some days together; till all of a sudden it was again discharg’d by the penis, “without the least pain, or troublesome symptom:” and that in this manner the urine continued to be evacuated, in the following years.

(*l*) Cent. 5. obs. 47.

(*m*) Eph. n. c. cent. 10. obs. 56.

(*n*) Tom. 1.

(*o*) Sect. 24. obs. 6. §. 1.

(*p*) Cent. 2. obs. Med. 90.

(*q*) De abdit. morb. causis c. 7.

(*r*) Eph. n. c. cent. 5. obs. 3.

We are not at liberty, therefore, to explain every excretion of urine per anum, in that first manner; but where on account of a renal, or vesical ischuria, the blood is overloaded with the urinous particles; and there is no sign of any morbid passage being open'd from the kidneys or from the bladder, to the intestine; the case is rather to be explain'd in the following manner: I mean that as the urine may be thrown up by vomiting; which I have already said (s); so it also may be discharg'd from the intestines, in consequence of the intestinal glands preternaturally secreting it.

Nevertheless, even taking this method for granted, we do not easily conceive, how the urine, when effus'd into the intestinal tube, should be excreted without any mixture of the intestinal fæces, as I just now related: which difficulty is not even wholly remov'd, by supposing that method, first spoken of; as when the woman, mention'd by Horstius, did not emit the urine from the anus, together with the intestinal excrements, but "separately;" for Hildanus had observ'd, in his old man, that the urine sometimes flow'd "separately, and at other times in conjunction with the fæces."

I happen'd, some years ago, to light on a case, in endeavouring to understand which; its cause, and the manner wherein this cause operated; that difficulty, which I just now propos'd, seem'd no more to be one of the most considerable.

A young priest, who, at his death, by reason of his excellent natural disposition, his probity worthy of his office, and his manners which were always exemplary, left all his acquaintance inconsolable for his loss; having related to me, that he had observ'd, a few days before, his urine to be discharg'd per anum; I, who knew him to be hypochondriac, as many are who are given to the study of letters, at first did not believe him: but, the day following, when he had taken care that the urine, which had been just before discharg'd in this manner, should be brought to me, I then at length very closely inquir'd of him, whether he had been ever affected with any disorder of the urinary parts, or of the lower intestine, with any pain, or uneasiness whatever? And if not long before, yet, at least, whether he had been troubled with any inconveniences in making water, or going to stool, at any time lately? Or was at that time troubled with any? Whether any thing bloody, or purulent, had been discharg'd by either passage? Or was now discharg'd? And other things of the like kind.

But he answer'd each of these questions in the negative: so that of course he denied them all; and that in such terms, as would have gain'd credit to a less ingenuous man than him.

There had been none here, as you see, of the causes which I just now took notice of; no exsection of a calculus, no abscess, no fall, no blow, no calculus of the kidneys or bladder, no suppression of urine in the one or the other; and yet the urine was discharg'd, very often, every day, from the bladder, and the anus, at the same time; and this very fluid, which generally flow'd, from the intestine, without any of the excrements being mix'd with it, continued to flow from thence even to the day of his death, which was brought on by quite a different disease; that is, continued to flow for many months, without the least pain or uneasiness to him.

When this young gentleman died, it happen'd that I was at a distance, in the place of my nativity; so that it was not possible for me even to ask for the liberty of inspecting his body, and, perhaps, have the opportunity of learning from the dead body, what I could not sufficiently understand in the living. But thus far at present. The next letter you may expect to be somewhat shorter: in the mean while, farewell.

LETTER the FORTY-THIRD

Treats of Hernias.

HERNIAS, of which I am now about to treat, are divided by the most learned men at this time (as you very well know) into the legitimate and spurious; legitimate they call those in which some viscus of the belly is prolaps'd, and the others spurious. I shall follow this order. Of those hernias, therefore, the observations of which still remain in the papers of Valfalva, these belong to the class of legitimates.

2. A man of thirty years of age, dying of a wound in his head, and having seem'd, when living, to have three testicles, the scrotum and inguina were, for this reason, dissected: and therein we had the following appearances.

The testes were only two in number: and these were in their natural state. But that which seem'd to be the third, and lay on the left side, was a portion of the omentum; which had descended into the scrotum, wrap'd up in its proper sacculus, made up of the peritonæum. On the right side also was a tumour, but of a less size: and this was made up by the appendicula vermiformis prolaps'd into a similar sac.

3. We have, here, an example of an epiplocele, and enterocele, at the same time; and something peculiar in both. The portion of the omentum, which, in the living body, had resembled a testicle, must be added to the other instances, which may impose upon us in like manner; and which formerly created a suspicion in me (a); in reading such a number of observations of three testicles, taken notice of by De Graaf (b), and others; that there was some deception in many of those which were not confirm'd, by dissection, after death.

(a) Advers. 4. Animad. 1.

(b) De Viror. Organ. generat. inservientib.

And indeed, this man would certainly have increas'd their number, if the mistake had not been corrected by dissection; as it was corrected in another, whose third testicle, as it seem'd to be, was nothing else, in fact, but an hydatid of the bigness of the true testicle, and very similar to it in figure; as is asserted by the celebrated Schreiberus (*c*).

However, a portion of the omentum found in the scrotum, would formerly have excited admiration, in those whom the celebrated Heister (*d*) points out, and confutes, by his observation of a double epiplocele being found in one man, and in the same part.

But if the appendicula vermiformis had fallen down into the scrotum, together with the intestinum cæcum, or even with the neighbouring part of the colon; although I know that this does not fall down so easily as the left part of the colon; yet if the ligaments of the colon, on the right side, being relax'd, or broken through, as in the observation of Waltherus (*e*), the appendicula had descended together with this, and the cæcum, into the scrotum; the weight of these parts forcing the peritonæum downwards; it would be more easy to conceive how that could happen, than how this appendicle alone, which is so flexible and light, should have come thither: unless it was, perhaps, at that time greatly distended, which it seldom is, with excrements; or rather, unless it had enter'd into a facculus form'd by the intestinum ileum, after the return of that intestine into the cavity of the belly; its length being of great assistance thereto.

This difficulty was acknowledg'd by Lavaterus (*f*), who, however, did not see this appendicle in the scrotum, though he saw the intestine colon therein, and on the right side too, "to the bigness of more than a man's fist:" and this I have said happens with more difficulty than on the left side; unless the hernia should be the consequence of a violent blow, or a fall from a high place: an example of which kind you have in Tacconus (*g*).

But Mauchartus (*h*) affirms, "that a part of the colon, and even the whole arch of this intestine, sometimes falls down into the scrotum;" on the left side; where he says he had seen it three times on that side; and "that a hernia of the colon was found," on the same side, by a celebrated surgeon of Paris, "where the cæcum, together with its vermiform appendix, had fallen directly into the scrotum."

And even the celebrated Henfingius (*i*), likewise, saw an oscheocele, on the left side, "which contain'd eight ells of the small intestines, the intestine cæcum with the vermiform process, and half an ell of the intestine colon."

And these things I take notice of, that you may know how far the ligaments, of the colon, may be relax'd, in large hernias; so as to suffer this intestine to follow the small ones, when dragging downwards by their weight; and even the appendicula itself to be prolaps'd, into the left part of the scrotum, though together with the cæcum.

(*c*) Nov. Comment. Acad. Sc. Imp. Petropol. tom. 3. inter physica obs. 6. & tab. 12. fig. 2.

(*d*) Eph. n. e. cent. 5. obs. 85.

(*e*) Act. Erud. Lips. a. 1738. M. Jun.

(*f*) Dissert. de Intestinor. compres. thes. 5.

(*g*) Dissert. de raris Herniis quibusdam.

(*h*) Dissert. de Hern. incarcer. c. 2.

(*i*) Dissert. de Periton. ad §. 8.

But we shall have an opportunity below (*k*), likewise, to speak of large enterocoeles. At present, as I have already describ'd to you observations, both of the epiplocele, and enterocoele, in other places, from Valsalva; I shall subjoin, here, the two of this last kind that remain; though they were but small.

4. A poor man, of sixty years of age, of a very bad habit, and afflicted with a rupture, being expos'd to the cold air, and perhaps his strength failing him, fell down; broke the os humeri in the middle, and slightly bruis'd his face. Not long after this he died.

The belly being open'd; if you except the vasa lactea turgid with chyle, that arose from a large tract of the intestines, without the interposition of any lymphæducts, which were seen in other places through the mesentery; and other appearances of the same kind (which we reserve to another place) nothing occur'd that was worthy of admiration; besides a part of the intestines, which, having fallen down from the belly, into a sacculus form'd of the peritonæum, was buried in the usual way in the scrotum.

When the left cavity of the thorax was laid open, the lungs immediately collaps'd upon the entrance of the external air; just as they do in living animals: but this could not be observ'd on the right side. However both lobes of the lungs were found.

In the brain was contain'd a little water; and in some places a gelatinous concretion was observ'd.

The muscular parts of this carcase were soft and flaccid: the blood was almost serous; and had very little of its red part. But what red it had show'd some solid bodies swimming in the serum: yet in it were no fibres; for when this blood was thrown into water, there appear'd no fibrous concretion.

5. Another poor man, of about five and thirty years of age, being in like manner expos'd to the injuries of the cold, was brought into the hospital, on the evening of January the fifth, in the year 1690, when he was already without pulse. He complain'd, with a faltering voice, of a violent pain in his belly: and as this was suppos'd to be from the prolapsus of the intestines into the scrotum, to which he was subject; they endeavour'd to replace them. In the morning the man died.

While the body was cut open, the fleshy parts discharg'd a great quantity of fluid.

In the belly, every thing was natural; except that a part of the intestines was even prolaps'd on the right side: the peritonæum being relax'd in the groin and expanded, within the scrotum, into an oblong sac, with a very narrow orifice.

When the thorax was laid open, the lungs appear'd to be variegated with black spots, and black blood; and on the posterior part, where they adher'd by membranes to the ribs, were in some measure inflam'd. In the right ventricle of the heart was a pretty large, and in the left a small polypous concretion, together with grumous blood.

But as to lymphatic vessels being obvious throughout the surface of this heart, and of almost all the remaining viscera; how distended they were in

the mesentery, and represented a series of globules, as it were; and other things of the like kind; I shall have a more convenient opportunity of speaking on these subjects hereafter.

6. If you ask the reason, why I did not give you these two observations of Valsalva in other places, rather than here; I shall say, I have not given them in other places, because the last symptoms of the former patient are not put down; and the dissection of the head of the latter. And I have copied them here; to show you that the viscera, which Valsalva had seen to be prolaps'd, did not fall down through a rupture of the peritonæum, but through a relaxation of this membrane; nor within a process of it; but within a sacculus made up of this membrane relax'd.

Nor has he above (*l*), nor in five other observations, made by him, upon hernias, which I have formerly describ'd to you (*m*), laid down any thing repugnant thereto; but has even, sometimes, said what agreed perfectly therewith. And if you read, over again, eleven other observations already given by me (*n*), you will find nothing repugnant to this doctrine; but a confirmation of it.

Nor will you be surpriz'd, when you attend, not so much to that persuasion which had formerly possess'd the minds of most persons, as to the observations of those, who, setting aside this persuasion, chose rather to be determin'd by accurate inspections.

Thus Arantius (*o*), even in very large ruptures, saw "no solution of continuity in the peritonæum." Thus, in that section of the Sepulchretum, which relates to the present subject, that is in the twenty-ninth; in which I find nothing said of Arantius; you will read that Hildanus (*p*), Riolanus (*q*), Barbette (*r*), to whom you may add Ruysch (*s*), and Benevoli (*t*), confirm the same thing.

And, indeed, though this last author had occasion to investigate these things more than a hundred times, and Ruysch not less often; yet both of them assert that the peritonæum had *never* been ruptur'd in hernias. But you will say Arantius does not deny the possibility of its being ruptur'd; and Barbette, if you read him a little below (*u*), speaks in such a manner, as to lead us to suppose that he had seen it ruptur'd, in that kind of hernia which they now call crural.

Yet he does not expressly say that he had seen it. And others, besides those I have mention'd, deny their having ever seen it; particularly Mauchartus (*x*), who affirms that in five bodies which had herniæ, he found the peritonæum "only dilated; though the bodies were very cautiously dissected by him for this purpose; that he had never found it ruptur'd, and even that "it had certainly never happen'd to the celebrated Parisian surgeons, whom "he had consulted upon this rupture; notwithstanding they have a very "ample and frequent opportunity of inquiring into ruptures."

(*l*) N. 2.

(*m*) Epist. II. n. 20. V. n. 2. XXXIV. n. 7.
& 5. XXXVIII. n. 2.

(*n*) Ep. V. n. 19. XXI. n. 15 & 19. XXIV.
n. 16. XXVI. n. 37. XXXIV. n. 9. 11. 15. &
18. XLI. n. 10. XLII. n. 34.

(*o*) De Tumor. c. 48.

(*p*) (*q*) Schol. ad obs. 19. vers. fin.

(*r*) Obs. 1.

(*s*) Advers. Anat. dec. 2. n. 9.

(*t*) Dissertaz. 1.

(*u*) Chirurg. p. 1. c. 7.

(*x*) Dissert. supra ad n. 3. cit. c. 2.

And lest you should be in doubt, whether he consulted them only in regard to small herniæ, and not of large likewise; he had, a little before, mention'd letters sent to him from one of them, in which he says that he had just then found three ells of the small intestines, together with a portion of the colon, in an "enormous" rupture.

And if you still require larger; Henslingius, besides that which is mention'd above, will give you another (*y*), containing eight ells of the intestines and more, which he receiv'd from the celebrated Hommelius (*z*); who, in an infant of two years old, saw "all the chylopoietic viscera" to have fallen out from the navel: "the peritonæum not being ruptur'd, but only extended and relax'd;" as Henslingius had also seen in his observation.

And before them Mery (*a*), in the left side of the scrotum, of a certain old man, which was enlarg'd to a monstrous size, found the cæcum, together with the beginning of the colon, drag'd down thither by the small intestines, which were all of them prolaps'd in that place; except the upper part to the length of half a foot, by which the stomach was likewise so drawn down, from its situation, as to descend, in a right line, from the diaphragm towards the lower parts of the belly: yet a purse or sac, made of the peritonæum, closely embrac'd all this very large tumour.

Nor would I have you say that Mery, when he before (*b*) gave us the observation of that not small hernia; from a virgin; which, besides two circumvolutions of the intestine colon, contain'd a tract of the small intestines to the length of four feet at least, and had this singularity; on account of which it is surprizing, that it should be scarcely taken notice of, by any of the authors, who have written of ruptures since that time; I mean that it extended from the left groin, quite to the middle of the thigh; do not say then, that Mery, in giving this observation, has not made the least mention of a containing peritonæum.

For it is natural to answer, that, in a hernia, the involucra of which, as well as the small intestines contain'd therein, had been putrefied by a gangrene, there was no opportunity for the surgeon to examine, whether the peritonæum had comprehended these parts; as this membrane must have been already destroy'd by that putrefaction, rather than ruptur'd.

And suppose the same thing to be said, in respect to the observation of Tacconus (*c*) on another virgin; in whom, not below the ligamentum Poupartii, as it is call'd, but from the same place as in the former, the intestines having been prolaps'd for many years, at length fell down suddenly without the hernia: not so much because the peritonæum, that lay in contact with them, was ruptur'd, as half-corrupted; and most probably, from the same cause, that had ulcerated the lower integuments of the hernia.

For you will see, that, in a much larger rupture, spoken of by the same author, whatever part of the colon and mesocolon was therein, as the delineated figure clearly shows (*d*), "had been invested round about" by the

(*y*) N. 3.

(*z*) Ad §. ibid. cit.

(*a*) Mem. de l'Acad. R. des Sc. a. 1701.

(*b*) Ibid. obs. 4.

(*c*) Dissert. supra ad n. 3. cit.

(*d*) Tab. 3. fig. 1.

peritonæum. Other large hernias I have both read of, and seen: as that which Teichmeyrus (*e*) represented as hanging down "quite to the knees;" and those which Schacherus (*f*), and Meekrenius (*g*), have said were "extended beyond the knees;" and not to be too prolix, that which the celebrated Brebifius (*b*) has represented, as "hanging down quite to the calves of the legs."

But the first has only said (*i*), that a large portion of the small intestines, of the large intestines, of the mesentery, and omentum, had been contain'd therein: whether the second dissected his hernia, I do not know: the two others certainly did not; nor did I dissect that which I saw in a bishop of a noble family; I mean an oscheocele alone, which was unequal in length, indeed, to that represented by Meekrenius, but not in thickness; nor in this, that the viscera, which it contain'd, could very easily be forc'd back into the belly: but they could be retain'd there by no means whatever.

7. Is there no observation then, you will say, of the peritonæum being ruptur'd in herniæ? I do not contend for this; but only that they are much more rare than was formerly suppos'd. And although Dionis (*k*) asserts; that an omphalocele happens only if the peritonæum be ruptur'd; and that 'he, although he had open'd many omphaloceles, both in the living, and dead body, could never discover that they were invested internally by the peritonæum; and even that by cutting into the skin, he had found no membrane besides; yet you have seen just now (*l*), how large an omphalocele Hommelius saw comprehended in the relax'd, not ruptur'd, peritonæum: and you may see, that Paul Barbette (*m*) had sometimes demonstrated, in dead bodies, that although the navel, together with the subsequent intestines, protuberated so as to equal the size of a man's head, the peritonæum was nevertheless "expanded only, and not ruptur'd;" and, in like manner, that Hottinger (*n*); in the omphalocele of a woman, which was a foot in its diameter, or more; having taken off the skin, "open'd the peritonæum, " which in thickness, and density, resembled the external skin, and was "difficult to be cut through; having the intestines firmly annex'd to it," as, in a girl dissected by Schulzius (*o*), it had the omentum connected to it, in most places.

To these add the observation of the illustrious Haller (*p*), who found the peritonæal sac whole in the exomphalos, as well as in other herniæ. In consequence of these observations you will perhaps suspect, that, in some of the dissections of Dionis, at least, his eyes had been deceiv'd, by the great extension of the peritonæum, and its close connexion with the common integuments.

I also read, that, in a crural hernia, a man of eminence (*q*) found a portion

(*e*) Dissert. de Exomphalo inflamm. §. 11.

(*f*) Dissert. de Morb. a situ. intest. p. n. c. 3. §. 3.

(*g*) Obs. Med. Chir. Posth. c. 5.

(*h*) Act. n. c. tom. 4. obs. 25.

(*i*) Dissert. cit. §. 18.

(*k*) Cours d'Operat. de Chir. demonstr. 2.

(*l*) N. 6.

(*m*) Sect. hac Sepulchr. 29. & obs. 1.

(*n*) Eph. n. c. dec. 3. a. 9. & 10. obs. 231.

(*o*) Act. n. c. tom. 1. obs. 226.

(*p*) Opusc. Pathol. obs. 29. & seq.

(*q*) Commenc. Litter. a. 1745. hebdom. 24. n. 1.

of the omentum, colon, and ileum, “in a cavity of the ruptur’d peritonæum.”

Verheyen (*r*) nevertheless; who was one of the first that describ’d this kind of hernia, and the manner in which patients die from an interception of it; has asserted, that it was made by the peritonæum being “gradually dilated in that part; or, what very rarely happens, by the peritonæum being ruptur’d:” and I myself, as I have already told you (*s*), have certainly seen the facculus of it in that part; as others have likewise; and among these Mauchartus (*t*); and if you require a larger sac, Wernerus, as you read in the fame Mauchartus (*u*); who dilated a sac in the fame part, which contain’d, beside a long portion of the omentum, a part of the intestinum ileum, “almost of the length of two feet and a half.”

But if we are to consider the oscheocele chiefly, which is not only the more frequent hernia, but gave me occasion to enter into this discussion; we must not dissemble, that, in the very section of the Sepulchretum (*x*), which treats of this subject, two observations are extant; the one of John Rudolph Salzmann (*y*), the other of Frederic Hoffmann the father (*z*); the former of whom says, that, in this hernia, he had demonstrated “the peritonæum to be ruptur’d;” and the latter, that he had seen, “with a dilatation of the external coat of the peritonæum, the internal ruptur’d, and lacerated.”

It may be wish’d, in regard to these observations; which if they are compar’d with the others, that are almost innumerable; are very rare; that what had been the cause of the hernia in both of them, was not unknown to us. For to open myself to you ingenuously, as my custom is, I am, in some measure, a follower of our Fabricius (*a*), and even of Paulus Eginetta (*b*), whose sectary he is.

That is to say, I follow them in this doctrine which they have taught us; that the rupture, whereof we are speaking, is brought about, either by a dilatation, relaxation, or rupture of the peritonæum; and in this likewise; that when it happens from a rupture, “the intestine is suddenly, and at once, push’d down in the beginning; and that from violent causes only: and there is a very large tumour;” or, as others translate the words of Paulus; “it is of an immense magnitude.”

Yet in this I cannot follow them, that a rupture is always to be acknowledged, even where all these signs have come together.

For my assent to this doctrine is withheld, not only by the observations before advanc’d, of large ruptures, and those which violent causes (such as a fall from a high place, or the like) had produc’d, or increas’d, without a rupture of the peritonæum; but also by reason; which, as Mauchartus (*c*) shows, by no means forbids us to suppose what causes there might be, either from the original formation, or afterwards, of so great a propensity to dila-

(*r*) Anat. corp. hum. l. 1. tr. 2. c. 7.

(*s*) Epist. 34. n. 15.

(*t*) Dissert. supra ad n. 3, cit. c. 4. in fin.

(*u*) Dissert. de Epiplo-Enteroccele Crurali.

(*x*) 29. l. 3.

(*y*) Obf. 3.

(*z*) Obf. 14. §. 3.

(*a*) Pentateuch. l. 1. c. 24. & de Chirurg. Operat. ubi de Intest. Hernia.

(*b*) De Re Medica l. 6. c. 65.

(*c*) Dissert. supra ad n. 3, cit. c. 2.

tation, in this membrane; that the circumstance, to which there was a previous disposition long before, might seem to be brought about of a sudden.

And this being the state of the matter; I commend Fabricius so much the more; for asserting that this membrane (*d*) “was either dilated, or ruptur’d:” but that, for the most part, it was dilated;” the more I perceive there may be room for his assertion: not only when herniæ are form’d “gradually and “slowly,” as he suppos’d; but even when they are form’d of a sudden.

Yet if you now produce the observation of Saltzmann (*e*), on the stable-keeper, who labour’d under a bubonocoele before, and in whom, by the kick of a horse in his belly, “the whole bulk of the intestines fell down into the “scrotum in one moment as it were;” so that this part seem’d almost like another belly in magnitude (the abdomen being, in the mean time, extremely collaps’d) and confirm it by another observation which he takes notice of from Petit; who, in a similar case, which happen’d from the same cause, found the peritonæal sac open’d; I shall without difficulty allow, that, in both of the examples, the peritonæum had been ruptur’d: nor did I ever persuade myself that this membrane had so much strength, and firmness, as not to allow of its being broken through by blows of this kind, or other violent causes; which, for that reason, I was willing to suppose had been applied, in those two observations of Saltzmann, and Hoffmann, which I said are extant in the Sepulchretum.

I do not, however, suppose this to happen from every cause that is call’d violent, nor at all times; and I even suppose it to happen but seldom. Among these causes, for instance, I see that riding on horseback is now reckon’d by many: nor do I deny, if it be too frequently us’d, that it may cause, and increase, herniæ, from an extension of the peritonæum; as I bear in mind the example of Marcus Servilius, of whom Livy (*f*) relates, that while he was haranguing the people; and showing the scars of wounds, which he had receiv’d in the forepart of his body, in the cause of his country; “the “parts, which should have been conceal’d, being accidentally uncover’d, a “tumour of the groin had rais’d a laugh in those who stood near him;” and that he then went on to say, “and this tumour also, which is the object of “your laughter, I have got by sitting, night and day, on horseback: nor am “I more ashamed, or sorry, for this tumour, than I am for these scars; since “it was never any impediment to me, in the administration of the common- “wealth, either at home or abroad.”

And he had been consul, and master of the horse, and had fought three and twenty times with the enemy, in pitch’d battles. His rupture therefore, whether it was a bubonocoele, or; as the Latins made use of the word *inguina*; an oscieocoele; that is, whether it was an inguinal, or a scrotal hernia; it was not, I say, one of these large ones, which are accounted for from a rupture of the peritonæum: for it must, on this supposition, have been a hindrance to him, in performing those offices which he had perform’d; as besides that one, whom I took notice of above (*g*), from Meekrenius, I have

(*d*) De Operat. loco indicato.

(*e*) Differt. de Hern. Vescic. thes. 21.

(*f*) Hist. l. 45.

(*g*) N. 6.

read of no person, whose alertness of action was not, for the most part, much obstructed by an obstacle and burden of this nature.

Riding for a long time together therefore ; and that at the fullest speed the horse can be rous'd to by spurring ; if repeated very frequently, may, I believe, be sometimes capable of rupturing the peritonæum : and at the same time, I cannot help supposing, that every exertion of the body, in leaping, or dancing ; that every fall from a high place ; that every blow ; that every strong exertion of the voice ; finally, that every straining, and holding of the breath ; which may relax the peritonæum ; is not equal to the task of breaking through this membrane.

And thus far of this controversy. Now let us go on to the hernial sacculus itself.

8. It was formerly believ'd that the hernial sacculus was the process of the peritonæum dilated ; I mean that process which they suppos'd to receive the spermatic vessels, from the cavity of the abdomen ; and, after having accompanied them, to expand itself, at length, into the tunica vaginalis : and this they continued to believe even after Fernelius (*b*) had so clearly shown that the peritonæum was not perforated for the egres of these vessels.

But truth was at length superior to error, by the consent and diligence of more accurate dissecters : with whom you will plainly perceive Valsalva's observations, upon herniæ, and mine, to agree ; by reading over again those which are describ'd pretty much at large.

For see in the thirty-fourth letter (*i*), how expressly he denies the sacculus to be made up of the process of the peritonæum, which accompanies the spermatic vessels ; as they formerly believ'd : and he even says that it lay upon this process, at the superior part.

Wherefore, in the first of the three observations, which I have describ'd to you above (*k*) ; when he says that the omentum was contain'd within its "*proper*" sac, made up of the peritonæum, without doubt he made use of this word *proper*, that we might immediately distinguish it from that process, which was also common to the vessels.

And I have often plac'd the matter in so clear a light, as to make an interpretation needless. Thus in the fifth letter (*l*), I have said that the sacculus was very near to the vagina, or sheath, of the spermatic vessels ; of whatever nature this vagina may be suppos'd.

Thus I have said in the twenty-first letter (*m*), that the sacculus was in the beginning, and progress, of it, on the internal side of these vessels ; betwixt the membrane that covers these vessels, and that coat which is join'd to the cremaster muscle. Thus in the twenty-fourth letter, I have said (*n*), that the sacculus descended under this very coat, and on the same internal side of the vessels ; and that near the orifice of this sac, these vessels went to, not the cavity of the belly, but the peritonæum : but in another (*o*) you will find that it was near to the external side of these vessels.

(*b*) Physiol. l. i. c. 7.

(*i*) N. 5.

(*k*) N. 2.

(*l*) N. 19.

(*m*) N. 15.

(*n*) N. 9.

(*o*) N. 18.

There are, indeed, some differences, betwixt my observations, and those of others, and even those of Valsalva himself. For he, as I have said, saw the sacculus lying upon the vessels, in a dead body, on the superior part; that is, if you suppose the body erect, at the anterior part; which some very learned men say to be "perpetually" observ'd.

But I have met with it, sometimes, on the internal, and sometimes on the external, side of those vessels. And there is one person, if I rightly conceive, who has seen the cremaster muscle lying betwixt the sacculus, and the vessels; which I suppose to be much more rare: at least I have found it otherwise, as I have already said.

These differences of situation, however, although very necessary for surgeons to attend to; do not, by any means, prevent me from agreeing with Valsalva, and both of us with the most accurate observers; in that which is its principal circumstance: I mean that the hernial sacculus is one thing, and the process of the peritonæum another: although, at this time, there is no small controversy amongst anatomists, in regard to acknowledging this process.

For as to Fernelius denying that it was made up of the internal coat of the peritonæum, and asserting it to consist, at least, of the other external coat; how can they admit of this supposition, who do not acknowledge any such external coat? In which number however, I do not sufficiently know, why this learned man seems to place Swammerdam, from his notes on the *Prodromus Hornii*; Ruysch from the ninety-eighth observation; and Justus Schraderus from the fifth observation of the second *Decuria*.

But they who, in fact, consider the cellular membrane as forming this coat; as they do not deny that this at least descends into the scrotum with the spermatic vessels, grant us enough, in the mean time, to set aside the controversy, and, at least, to mark out this involucrum, in which these vessels are contain'd, and which proceeds from the peritonæum, under the term vagina, in respect of these vessels, and under the term process, in respect to the peritonæum.

Nor was Valsalva himself, in my opinion, very distant from an explication of this kind; when he us'd the expression process of the peritonæum (*p*). For although he did not always teach me the same thing, upon this subject, when I was a young man; yet I very well remember, when he, finally, deliver'd himself thus: that neither the tendon of the external oblique muscle, nor the peritonæum, in that part through which the spermatic vessels descend from the abdomen, properly so call'd, towards the scrotum; I say, that neither this tendon is perforated, into the form of a real ring, nor the peritonæum is hollow'd out into a sheath; both of which circumstances were generally believ'd; but only some filaments were sent down, here and there, over those vessels: nor was there any other connexion betwixt the peritonæum, and the tunica vaginalis.

From whence you also understand, that he did not consider that process as a kind of continued canal; which, having first closely embrac'd those vessels, at length expanded itself into the tunica vaginalis. Nor indeed could he be ignorant that the cavity of this coat does not raise itself up much above the testicle; as this not only appears from inspection of the parts ana-

tomically, but even Swammerdam in his *Miraculum Naturæ* expressly admonishes us, that this coat “does not extend itself much beyond the testicles.”

And Blasius, having follow'd this opinion (*q*), has made, from thence, such deductions as I shall take notice of below (*r*), when I treat of the hydrocele: in the mean while you may see them in the Sepulchretum (*s*). And as these deductions are transfer'd thither, so it would have been also proper, to transfer what has been observ'd by Swammerdam, in the place refer'd to; and what Justus Schraderus (*t*) has observ'd together with him, of the process of the peritonæum; if there be such a one; and the hernial sacculus, being quite different things.

What is it then, you will say, that Boscus relates in the Sepulchretum (*u*); “that the vagina of the testicle, made by the peritonæum,” was demonstrated, by him, in a child labouring under an enterocele, “to be so dilated “in its origin, and quite to the fundus, and termination of it, that two “fingers easily were introduc'd into it?”

I should suppose it probable, that by some very rare accident the lower part of the hernial sac was burst through on one hand; and on the other, that the upper part of the tunica vaginalis was ruptur'd also; by which means they had coalesc'd into one tube: or that, as Mery (*x*) suspected in a certain singular observation of his, similar to the present, in this boy the tunica vaginalis, as is the case in most quadrupeds, had happen'd to be quite pervious, from the cavity of the belly to the testicle; I should suppose it probable, I say, if Boscus did not affirm that he had seen the same thing “frequently,” and did not think “it was easily to be seen by all.”

Since therefore, it has not only not happen'd to others, to find it thus, but to me likewise; and since it has even been found quite otherwise; it remains to suspect that this author, and those who were present, were led into an error; perhaps by the extenuation, and adhesion, of both the coats to each other, and at the same time to the testicle, in so great a degree, that this might seem to be quite protuberating within the hernial sac, in the body in question.

9. But it becomes us, still more, to beware of other blunders in the living body; lest we imagine an intestine, or the omentum, to be prolaps'd out of the cavity of the belly, without reason.

There are many things which render incautious persons liable to this error; as, for instance, the testicle, when about to descend into the scrotum very late, as sometimes happens; for it raises up the groin, yet cannot easily be mistaken for a bubonocoele; except by those who, not imitating Brechtfeld (*y*), neglect previously to examine the scrotum, especially in children, and observe the testicle to be deficient therein: as for instance also, one of the inguinal glands, increas'd into that form which I describ'd in the thirty-first letter (*z*), in the butcher; or many of them together with coagulated serum,

(*q*) Obf. Anat. in Hom. ubi de Teste.

(*r*) N. 32.

(*s*) Sect. hac. 29. obf. 2.

(*t*) Dec. 2. Obf. Anat. Med. 5.

(*u*) Sect. cit. obf. 5.

(*x*) Mem. de l'Acad. R. des Sc. a. 1701.

obf. 3.

(*y*) Vid. apud Bartholin. Aët. Med. Hafn. vol. 1. obf. 106.

(*z*) N. 19.

such as Reisilius found (*a*): and finally, as other appearances; in order to prevent being impos'd upon by which, all the other circumstances must be accurately inquir'd after, and consider'd.

I was at Venice, when a woman sent for surgeons, and physicians; and among these Santorini; in order to ascertain the nature of the tumour, which was prominent in one of her groins; as she fear'd lest it should be a bubonocoele, for this reason, that it had appear'd suddenly, as she was straining to discharge the harden'd excrements from the intestines.

All signs of a hernia were absent; except that immediately upon applying their hands to that part, the woman discharg'd wind by eructation.

Santorini, observing the physicians to be in doubt, merely on this account, smil'd; and said to them, and whatever part of my body you touch, you will hear eructations immediately come on. They instantly made the experiment, and found it to be as he had said.

When Santorini related these things to me, and to some more friends, others wonder'd at it as an unheard of circumstance; but I said, it is extraordinary indeed, yet not unheard of. For I remember to have read, in Etmuller (*b*), "that what Bartholin in the *Acta Medica Hafniensia*, page one hundred "and ninety-nine, and Rhodius in the fifty-second observation of the second "chapter, have observ'd, of continual eructations being excited, by external "friction, in any part of the body whatever, is very extraordinary."

Yet lest the same thing happen to you, which happen'd to my friends; if you should choose, in so very rare a case, to turn to the authors themselves, pointed out by Etmuller; in Rhodius you will certainly wish for a more happy memory in the reference; but in Bartholin you will see there is a typographical error; page one hundred and ninety-nine being put for a hundred and ninety-four; and will really find the observation of a man, "who from a "slight friction of any part of the body, immediately fell into so enormous "an eructation, that he did not cease to eructate before the friction ceas'd." But that observation is the hundred and second of the first part, of the first volume, of the acts already quoted; Brechtfeld, physician to the king's mother, being the author.

10. There are other appearances also, which are not equally rare to be met with, nor yet very frequent; and these not only in the groins, but also at the navel, and the scrotum; which may sometimes create a difficulty, to physicians, in distinguishing ruptures, and sometimes deceive them.

Thus I remember, that, in regard to a certain most serene prince; who, among other things, was also subject to flatus, and hypochondriac distentions of the belly, it was related to me by his physicians, who were in other respects excellent men, that a little above the navel of this great personage, and on the left side, an epiplocele had appear'd: in examining of which place, although I perceiv'd a kind of lax and slight prominence, of a circular circumference, the diameter of which was equal to three inches at least; yet as I perceiv'd nothing unequal to be under it, and the prince himself did not give such answers to my interrogations as confirm'd the judgment of the physicians; I chose rather to withhold my assent: nor was I sorry for it, when,

(*a*) Eph. n. c. dec. 2. a. 7. obs. 12.

(*b*) Prax. l. 1. f. 4. c. 2. in Prognos.

after some months, the patient having died from quite a different cause, I was inform'd, by the account of the dissection being sent to me, that the deception refer'd to by the celebrated Heister (*c*) had happen'd; I mean that there was nothing under the skin, besides fat distending the cells of the membrana adiposa, that was push'd outwards, not by the peritonæum, which was by no means lax, but only by reason of the very great quantity of fat, which was prominent in that part: of which kind of tumours I shall write to you hereafter (*d*).

But that this kind of tumour sometimes resembles bubonocèles, appears from the observation of Schulzius (*e*), in a man, in whom it was so much the more easy to be deceiv'd, because, as he was of a very lean habit, nobody would have thought of so great a quantity of fat being join'd to the spermatic vessels.

And although another whom Petschius (*f*) dissected was very fat; yet the deception was very natural for this reason; because the fat, collected in the cellular substance of the peritonæum, was carried out "through the rings to the scrotum;" not on both sides, but in the right side only; in such a quantity, that there seem'd to be an oscœocele in that part.

Moreover, in the scrotum; where, in other respects, frequently, when there is a complex kind of hernia, the one is obscur'd by the other, as when a great quantity of water, lying round about, prevents us from distinguishing the included omentum, or intestine, or both, with our fingers; it may besides sometimes happen, that we may suppose a simple kind to be complex; or at least suppose it to be what it is not.

For who; in that observation of Vesalius, for instance (which you find copied in the Sepulchretum also (*g*)) when he had observ'd the scrotum to be so large and heavy; who, I say, would have thought it to have arisen from a part of the omentum only, which had fallen down thither, increas'd to such a magnitude, as "to weigh four or five pounds?"

Or how few; to come to a more recent example; would have been able readily to avoid the deception (into which Gunzius himself (*h*) confesses, with a very commendable ingenuoufness, that he had fallen) so as to think; when they saw a tumour narrow, and constricted at the groin, but in the scrotum large, and extensive, with a rotundity of figure; that no part of the intestines was there: but only that the omentum, which was found to be grown very thick, and folded back at its lower part, was contain'd therein?

Or who, finally, is there; to whom the observations (that are not often to be met with) of those excellent men, whom I commended to you in the thirty-fourth letter (*i*), are unknown; that, when he sees this symptom to be wanting, and not to be added to most of the others, of an intercepted intestine; I mean that the passage of the intestines is obstructed; dare affirm that some part of these is intercepted, either at the navel, or at the groin, or in the scrotum; as others have found, or at the upper part of the thigh, as I have found (*k*): and on the other hand, although no excrements pass, that, never-

(*c*) Inst. Chir. p. 2. l. 5. c. 120. n. 1.

(*d*) Epist. 50. n. 24.

(*e*) Act. n. c. tom. 1. obs. 225.

(*f*) Syllog. anat. obs. §. 83.

(*g*) Sect. hac 29. obs. 15. §. 3.

(*h*) Prolus. de Entero-Epiplocl.

(*i*) N. 16. 17.

(*k*) Ibid. n. 15.

theless, nothing but some part of the paries of the intestine is intercepted, as I have formerly seen in the groin (*l*); and very lately, even below this, that very experienc'd surgeon Anthony Benevoli (*m*).

But perhaps I shall also have occasion, hereafter, to point out blunders, which may easily happen, in the diagnosis of herniæ.

II. For now somewhat must be said, of those things that relate to the replacing of the intestine prolaps'd into the scrotum; in order to satisfy you in your enquiry, whether Valsalva was then averse to the use of glysters? This gentleman took the utmost care, as his duty was, and as you may perceive even from the opinion which he wrote, that nothing should obstruct the replacing of the intestine; and even that every thing should, as far as possible, give way to their return into the belly.

Therefore, when the hernia was become somewhat soften'd; which he brought about by the application of balls of raw silk, moisten'd in hot water, in which chamomile flowers, melilot flowers, linseed, and sænugreekseed, had been boil'd, and renewing them every fourth hour (for this was then the custom at Bologna, though the balls of raw-silk were more frequently moisten'd with the lixivium; here they use sponges dip'd into the dregs of olive oil made hot) he then endeavour'd, with a gentle hand, to replace the intestines; and this at a time when the stomach had been empty as long as possible, without any other situation of body being requir'd in the patient, than that which, as it is customary, he prescrib'd from the very beginning: and observing that instant of time in particular, in impelling the intestine, when the patient, by his orders, produc'd his expiration to a considerable length.

But previously to this he had order'd blood-lettings: especially where there was too great a quantity of blood; at which time he also recommended the other usual remedies; among which I understand even glysters; and at the same time he always prescrib'd great sparingness, in the use of food and drink, and the avoiding of every thing that could generate flatus: and besides these things he ordered an emollient broth morning and evening; and oil, fresh-drawn from sweet-almonds, to be taken through the day, in the quantity of a spoonful at a time, so as not to consume more than two ounces every day.

After he had replac'd the intestines, he took care the patient should keep the same posture of body; and that the return of the hernia should be prevented by a proper bandage; to which a piece of soft sponge, three inches long, as many broad, and one thick, was fasten'd. But when, after having often attempted to replace the prolaps'd parts, at proper intervals, he did not succeed in the attempt; and, in the mean while, no other violent symptoms oblig'd him to change his design; rather than create an inflammation, by teasing the part to no purpose, he then order'd the patient to avoid all these things which I have mention'd above, and to keep up to the same mollifying regimen, which I said may be made use of both internally and externally; but with those particularly the posture of lying down so often inculcated; I mean that the pubes should be higher than the other part of the belly: for by this means he said that nature often perform'd the cure of herself.

(*l*) Ibid. n. 18.

(*m*) Due Relaz. Chirurg. Relaz. 2.

Thus I have contracted the whole of his *Consilium* into a short compass for you; not because the greater part of the methods prescrib'd, are not common to all practitioners; but even for this very reason, that they are so: and this in order to convince you, that; as they all agree in this one intention, which is indicated by reason itself, that there may be nothing in the belly to resist the return of the intestines, but that every thing may give way; it does not appear, why formerly, and even in our time, some were so averse to the use of glysters: by means of which whatever can be brought down this way, may be evacuated from the intestines, without any irritation.

For as to their saying that glysters go down to the scrotum, and, by reason of their weight, depress "the intestines more, and increase the hernia;" this perhaps would have place, where the part of the colon, nearest to the rectum, had fallen into the scrotum; or where, by the peristaltic motion being already inverted, every thing was hurried away, from the rectum, into the other intestines.

And neither of these circumstances can be asserted by them: that is, the first cannot, because they confess "that the colon seldom goes out" into the scrotum; nor the second, because when "the most violent symptoms have already come on;" then, at length, even they themselves permit us to have recourse to glysters.

12. But when there is a necessity of making use of the knife, as Valsalva, whose method in particular you desire to know, has left nothing in writing, relative to the manner in which it ought to be us'd; there is no reason why I should detain you, on such subjects as are sufficiently treated of, by other authors.

I will, however, just touch upon a few things, which may be confirm'd by his dissections, or mine. And first, in regard to those things which most obstruct the return of the intestines; a narrowness at the orifice of the sacculus, a hardness of it, and a connexion of the prolaps'd parts to the sacculus, or to one another; that these appearances have occur'd to us sometimes, certain passages of the fifth (*n*), twenty-first (*o*), and twenty-fourth letters (*p*), and even of this very letter (*q*), will show.

You will, afterwards, attend to the changes which we find in the parts; either the parts within the sacculus, or those that lye near it. Among those, in particular, that is most worthy of observation which Valsalva saw, as you have it in the second letter (*r*); that is to say the testis; seemingly from the effect of an old epiplocele, in a young man, who had, in other respects, enjoy'd firm health, and was about two and twenty years of age; chang'd universally into a membranous body.

You will read, in the Sepulchretum (*s*), of "very small, compress'd, and yellowish, testes, scarcely equal to the bigness of a nutmeg," being found with a hernia; but a large hernia, and not made up of the omentum only, but also of no small portion of the mesentery, and the intestinum ileum; and that of twenty years standing, and in an old man of seventy.

(*n*) N. 27.

(*o*) N. 15.

(*p*) N. 5. 9. 18.

(*q*) N. 5.

(*r*) N. 20.

(*s*) Sect. hac 29. obs. 13.

He likewise was an old man, whose testicle nearest to the hernia, I found to be less than the other, and that in a considerable degree, being, at the same time, of a brown colour internally, inclining to red; as I said in the twenty-fourth letter (*t*). Yet that hernia was an enterocele; and by reason of inflammation fatal: so that it is evident, to what cause this colour, of the testis, is to be refer'd.

These two observations then, shew that the magnitude of the testicles is sometimes diminish'd, by reason of the parts being prolaps'd into the scrotum: and the first demonstrates that the very structure is sometimes universally chang'd.

From which, as you may perceive that what some have pronounc'd, is not always true; I mean, "that to be afraid of sterility, or impotency, from ruptures, is futile and absurd;" so you may also conjecture, that men afflicted with herniæ, sometimes, become impotent; not only because "the vessels," as Boerhaave (*u*) has taught, "grow to the sac;" but also because, besides the vessels, the testes themselves are press'd upon by the weight, not only of the prolaps'd intestine, but of the mesentery likewise; and sometimes by that of the omentum alone: and this for a long time together.

13. And what changes sometimes happen, to the parts which fall into the hernial sac; and how easily many, and considerable, errors, in the art of healing, may be produc'd by the neglect of this animadversion; Gunzius (*x*) has very learnedly admonish'd, where he confesses his own deception, in respect of the omentum. To whose observation of the omentum being become very thick, and fat, you will join the observations that were made before, of Sprogelius (*y*), in a living man, and of Mauchartus (*z*), in a body after death.

And that you may not suppose the omentum alone to be chang'd; you will also add that which is related by Lavaterus (*a*), "of the intestines being "soft like wet paper;" so that there is less occasion to be surpriz'd, if a suppuration in particular, or a gangrene, coming on, they are broken through, and pour out what liquid fæces they contain, into the cavity of the hernia: and so this hernia either resemble another species of herniæ, or an abscess; as the observations of the celebrated Heister (*b*) in living, and in dead bodies, jointly demonstrate.

But to insist upon the changes which Valsalva, and I, have seen to happen in the prolaps'd parts; you will learn them from the twenty-fourth letter.

Nor do I speak only of changes in the intestines; which you will find, in several places, to have been either inflam'd, or black and gangrenous, in consequence of the interception; but in the omentum likewise, and mesentery. For you will read that the omentum was doubled up, and form'd into a round body (*c*), which I could not learn the nature of, but by cutting into its substance.

(*t*) N. 16.

(*u*) Prælect. ad Instit. §. 641.

(*x*) Prolus. supra ad n. 10. cit.

(*y*) Eph. n. c. cent. 7. obs. 70.

(*z*) Differt. supra ad n. 3. cit. c. 2. in fine.

(*a*) Differt. ad eund. n. 3. cit. n. 23.

(*b*) Differt. de Hernia Incarcer. §. 10 & 15.

(*c*) N. 9.

And that a portion of the mesentery appear'd, to Valsalva, to be (*d*) almost fleshy, you will learn in the same place. That portion, I say, which, if the double intestine descends pretty low, must, of course, follow it within the sacculus; for by reason of the fat, with which it is furnish'd in great quantity, it can be much more easily relax'd, than ruptur'd. And it is suppos'd never to be more relax'd than in herniæ.

"This softness, and laxity, of the mesentery," says Wharton (*e*), "is frequently found in an intestinal hernia. For it is sometimes so far relax'd, as to permit the intestine attach'd to it; which it ought naturally to confine within its own circumference; to fall down into the scrotum."

But he whom I frequently, and deservedly, commend to you, Benevoli (*f*), has undertaken to show, in a dissertation which certainly well deserves to be read, that a laxity of the mesentery takes place always, not to say frequently, in these herniæ; and that even from thence they first have their origin. To which supposition relates the observation, that is given in this section of the Sepulchretum (*g*), from Hoffmann the father; who cries up the virtues of his magnetic plaister, in drawing up the intestines from herniæ, when applied to the loins.

But if the virtues, and efficacies, of this plaister are really so great, as to penetrate through the thickness of the loins; which it is very difficult to conceive; and even as they must, of course, be, to pervade the lumbar vertebræ, and corroborate the mesentery; I am surpriz'd that his son has made no mention; which, as far as I remember, he has not done; of this plaister, in any one of the several places, where he treats of herniæ, and their cure.

However, as Etmuller affirms (*b*), "that he had seen surprizing effects" from this plaister, I will, if you please, leave the merits of it entirely undetermin'd in this place; especially as, if a person, afflicted with a rupture, should be willing to apply corroborants, and astringents, to the loins; in that part where the mesentery is connected thereto; Benevoli has no objection to such an application.

But I do not believe that Benevoli had seen what was written, many years ago, by the celebrated Rostius (*i*); when in a man, afflicted with a rupture, he had found the mesentery lax; "I mean, that it was most probable intestinal herniæ particularly requir'd this laxity; since the intestines are firmly connected to the mesentery, and therefore cannot be remov'd from their situation, unless the mesentery, from some violent cause or other, first give way." nor do I believe, that the dissertation of Benevoli had come to the hands of the celebrated Brendelius (*k*), when he, still more confirm'd the same opinion.

For to the observation of Rostius, and the others of Benevoli; and that particularly which was made on the taylor, the greater part of whose large enterocele was not now made up of the intestines, but of an expansion of the mesentery; you have some from Brendelius, principally, that may be added: since he asserts, that, as often as ever he inquir'd into this circumstance, he

(*d*) N. 5.

(*e*) Adenogr. c. 11.

(*f*) Dissertatio 1.

(*g*) Obs. 14. §. 3.

(*b*) Prax. l. 1. f. 12. c. 1.

(*i*) Act. n. c. tom. 2. obs. 178.

(*k*) Progr. de Herniar. Natalibus.

had found the mesentery to have been, from the very original, “always immoderately relax’d, and, in a manner, distended;” and even in a porter, that the peritonæum itself was there disjoin’d from the large vessels, and that the mesentery in him, and in another, “was distended incredibly:” so that in the second, at least, in the places, where it generally is very small “it was of “the extent of three or four spans.”

And lest you should imagine these things to happen from the weight of the prolaps’d intestines, as well as the pains of the loins; Rostius admonishes us, that those who contract hernias, from the motion of riding on horseback, “generally feel a painful tension, first of all, about the loins; a pretty clear proof,” says he, of the mesentery, which is fix’d there, “being affected “with a tension, or distraction, of the fibres.”

And indeed, I have observ’d that the attentive physician Riedlinus (*), though he did not find, among authors, the signs of an enterocele coming on, had given hints long before, from a certain observation of his own, from what symptoms we may suspect it: and, in the number of these, had, in the first place, set down pains of the loins.

But it is certain, you will say, that in an oscheocele, a very eminent anatomist found the mesentery, which being, “like a small rope, tense, and “hard, had descended together with the intestines.” Shall we say then, that there was any thing lax, or weak, in a mesentery of that kind, and impute the origin of the hernia thereto?

I will ask of you, however, whether you suppose it to have been so tense, and hard, at the time of its coming down; and that it was not possible, for the same thing to have happen’d to it afterwards, which I said I had seen, even in the omentum itself, when intercepted; or that which Mauchartus, and Sprogellus, have remark’d in the same part, in their observations “of “its being very hard and almost scirrhus,” as already quoted?

And I will moreover ask you, if it could, possibly, have descended, with some cells of the small intestines, into a very large hernia, unless it had been extremely lax? For it is certain that, when it is in a natural state, it cannot reach so low downwards.

But do not be forward to suppose, that I say these things for the sake of defending the opinion of Benevoli, rather than what appears to me to be truth; especially as I attribute some of these effects, as he himself likewise did, to the laxity of the peritonæum also, and the rings; in conjunction with Rostius and Brendelius; and not all of them to the laxity of the mesentery.

14. From what I have hinted, and even still more from those parts of the letter, to which I have referr’d, you will call to mind what you have heard from me, at other times, in regard to observations made by us, on the bubonocele, oscheocele, omphalocele, and merocele; and of the parts that have been contain’d in these several ruptures: so that there is no occasion to repeat them here.

I am rather dispos’d to add something, in relation to these two herniæ last-mention’d.

In the omphalocele, though the omentum seems, as it has been found by us, and by others, to be necessarily included from its situation; yet.

(*) Eph. n. c. dec. 3. a. 9 & 10. obs. 150.

Rostius(**) shows, by his own observation, and by those of Arnould, and Petit, that it is frequently not included; but that a part of the intestine jejunum, or colon, occurs without it; where he also observes other things, in regard to vomiting coming on sooner, or later, according to the different intestine that is intercepted; and not always discharging the same kind of matter; which remarks will afford you pleasure as well as profit in perusing.

But if you should happen to wish for dissections of those who were affected with the merocele, to add to the Sepulchretum, you will find them in the observations which I have pointed out above (l); and in the papers of Genselius (m) besides; but particularly in the work of that author who publish'd a dissertation upon this disorder, which is commonly call'd the hernia femoralis, or cruralis; I mean the celebrated Daniel Koch (n).

And perhaps in looking over these authors, and those observations, and remarking that the greater part of the herniæ of this kind, was found to be in men; it may displease you to find it asserted, by a physician in other respects learned, "that men do not readily become subject" to this disorder: although, to confess the truth, it has never yet happen'd to me to see it, except in women.

Some herniæ, that are very rare; whether you consider the place in which they are form'd, or the parts that fall down; neither Valsalva, nor I have seen.

Among these, is that which happens where the obturator nerve, as they call it, comes forth, together with the vessels of the same name; which nerve, the same learned physician, to whom I just now refer'd, has call'd, for I know not what reason, "the posterior crural;" under which term others signify the nerve that is the thickest of all. Of this hernia, however, consult those authors that are quoted in the *Commercium Litterarium* (o), and by Platner (p).

Much more rare than this, is that which is accurately describ'd by Christopher Henry Papen (q); as he had found it in a body after death: for it was very similar to a large oblong bladder, beginning from the right side of the anus, and including within it a sac continued from the peritonæum, the small intestines, with the mesentery extremely elongated, and the beginning of the colon: and as these viscera had fallen down through the fissure call'd *Incisura Ischiadico-sacra*; as he to whom the observation was sent, that is the celebrated Haller, rightly judges; we will rather reserve the name of Hernia Dorsalis for that other, if it does at any time appear, which Paul Barbette (r), as the author very well knew, and as you also have it in the *Sepulchretum* (s), had refer'd to in these words: "experience has taught me, that the peritonæum may be ruptur'd even in the posterior part, towards the back, and "there produce a hernia."

But in the number of those herniæ that are rare, when consider'd in respect to the parts which prolapse, is the cyстоcele.

(**) Obs. supra ad n. 13. cit.

(l) N. 7.

(m) Eph. n. c. cent. 7 & 8. in Append. ubi Conf. Epid. Hungar. a. 1713. in Septembr.

(n) C. 2. §. 5.

(o) A. 1743. hebdom. 47. n. 1.

(p) Dissert. de Hydrocel. §. 2. not. 2.

(q) Epist. de stupenda Hernia Dorsali.

(r) Chirurg. p. 1. c. 8. vers. fin.

(s) Sect. hac 29. obs. 8.

And as in writing to you upon this hernia, in a former letter (*t*), I made mention of it in such a manner, as to shew that it happen'd to women in some analogous manner; that is to say, the bladder not falling out through the groin; I will now add, that in these patients, it does also sometimes prolapse at the groin: as two observations of Benevoli (*u*), whom I have often quoted, teach us.

And as in one of these he shows, how many years before this disorder had begun; it appears from hence, that this hernia is not the effect of the original conformation, as Mery (*x*) thought: especially, since of so many others, which I then pointed out from men, there was not one (as far as I remember) the beginning of which seems to have appear'd from the original constitution of the body.

How can it happen then, you will say, that the connexions, and ligaments, of the bladder, the peritonæum, and the muscles of the abdomen, suffer it to be push'd out through one or other of the groins?

Read, I beseech you, the dissertation of that ingenious man Jo. Salzmann (*y*), where to those things which Petit (*z*); he himself also being an observer of an hernia of this kind; had produc'd, in order to diminish these difficulties, he moreover adds other things which tend to make you think less of them; and of that one in particular which was drawn from the resistance of the peritonæum, that is mention'd on this occasion by many, who do not attend to this circumstance; that the bladder is not in the peritonæum, but under it.

Yet if it should not be possible to remove all these difficulties, this hernia, nevertheless, cannot, for that reason, be denied to exist; as not only the sign that has been already pointed out, and is very evidently pathognomonic, has confirm'd its existence, but even inspections of bodies after death, then pointed out in like manner; as those of our Jo. Dominic Sala in Bartholin, and of Ruyfch himself: so that it is surprizing there should have been any one, so late as in the year 1713, who look'd upon this disorder as new; and though some said it was first observ'd by one, and some by another, yet all contended that it was first observ'd about that time: although, even formerly, Platerus, who is mention'd by me in the same place, as soon as ever the urine flow'd from the distended, and wounded scrotum, in an ischuria of the bladder, knew the disorder to be this hernia of which we are speaking, and particularly describ'd it.

And lest you should be inclined to believe, that this contention had related, in part at least, to the hernia of the female bladder, when prolaps'd together with the vaginæ; call to mind that an observation of this kind had been publish'd by Pyerus (*a*), some years before that of Ruyfch, and confirm'd by a dissection, which you have even in the Sepulchretum (*b*).

This was afterwards follow'd by other observations taken from the dead bodies; and particularly by those of the very celebrated Bassius (*c*), and

(*t*) Epist. 41. n. 12.

(*u*) Osservaz. 25. 26.

(*x*) Mem. del'Acad. R. des Sc. a. 1713. obs. 3.

(*y*) De Hernia Vesicæ Urinar. thes. 22. &

(*z*) Histoir. de l'Acad. R. des Sc. a. 1717.

(*a*) Eph. n. c. dec. 2. a. 1. obs. 84.

(*b*) L. 3. f. 31. in additam, obs. 5.

(*c*) Dec. 3. Obs. Anat. Chir. 2.

Burgravius (*d*). Mery, who had very clearly confirm'd the descent of the male bladder, into the scrotum, by dissection in the dead body (*e*), found a hernia of the female bladder in a living woman only, in the perinæum (*f*): a very rare instance indeed.

These things, however, I do not say with a view to repeat any thing, but to illustrate, in a brief manner, what has been hinted at elsewhere; and to compleat whatever belongs to the history of herniæ of the bladder.

One still more rare than the cystocele is the hysterocoele, when laid open by dissection. Yet besides that observation of it, which is transferr'd into the Sepulchretum (*g*), two were publish'd in the epistle of Doringius to Hildanus; in reading the former of which, that is taken from the institutions of Senertus, you will observe this also; that in so large a hernia, and one that had its origin from a blow, the peritonæum, as far as Senertus could judge by the sight, had remain'd entire.

But who could doubt, even without dissection, that the uterus was really contain'd in three other herniæ; two of which are mention'd as "hanging down beyond the middle of the thighs," and a third "quite to the knees;" by Carolus Sponius (*h*), and Frederic Ruysch (*i*); when he reads that the foetusses were happily brought forth, the hernia being "lifted up" by the midwife, which Ruysch himself saw; or supposes that after the foetus was brought forth, the hernia subsided very much, and remain'd without its former internal motions: which marks, or others of that kind, Sponius must, of course, have attended to.

Add to these, the herniæ which are form'd by the prolapsus of other viscera; as for instance, by the spleen, which was found by the same Ruysch (*k*), in the dilated peritonæum; and by the stomach; two observations of which kind, although not confirm'd by dissection, yet by no means obscure, are given us by Peter Kirschbaum (*l*): and finally by the liver; which was found in a hernia, on dissection, by Solomon Reifelius (*m*).

These, and other hernias of this kind, if you consider the viscus that they contain, you will name from thence; as Reifelius does his hepatocele. But if you have a view to that part of the abdomen, in which they happen, you will name them from thence.

For if you should call any one *hernia ventris*, or *ventralis*, as many do now; you would rightly call it to be sure: but as you would point out nothing more than a genus, which is too extensive in its signification, you might still be ask'd about the particular situation; which you could not have been, if you had at first convey'd this idea.

And, in determining the seat of ruptures, do not imagine that you should do wrong, if you were to call that umbilical, which is not in the very ring of the navel; in which place I scarcely remember to have seen the prolaps'd part, in any other patients than in one very tender male infant.

(*d*) Aët. n. c. tom. 4. obs. 126.

(*e*) Mem. cit. obs. 1.

(*f*) Obs. 2.

(*g*) L. 3. f. 38. in Append. obs. 2.

(*h*) Apud Lavater. Dissert. de Intest. Compress. Thes. 13.

(*i*) Advers. Dec. 2. n. 9.

(*k*) Ibid.

(*l*) Dissert. de Hernia Ventric. §. 3. Hist. 1. & 2.

(*m*) Eph. n. c. dec. 3. a. 7. obs. 6.

Let it be sufficient for you that it is near the navel ; for you will have companions, and those not despicable ones neither, who will even understand it in the same light ; and do at present use it in this sense : but there may be as many different situations, as there are regions of the abdomen.

Thus, for instance, Lavaterus (*n*) saw a hernia in the right hypochondrium, under the spurious ribs, which intercepted a part of the intestinum jejunum. Thus other herniæ happen in other regions ; all which he successively names, or refers to in order ; so that I cannot help being surpriz'd at Rolsinc (*o*), for denying that herniæ happen in the hypochondria, or the pubes ; his words are, “ for I know of no example that can be given, where-
“ in these parts were ever seen to be thus affected.”

For, although other examples, probably, did not occur to his memory at that time ; notwithstanding they are now so frequently to be met with, that even I myself have twice examin'd (*p*) herniæ at the pubes, by dissection ; yet, at least, he ought not to have forgotten the passage of Hippocrates (*q*), which his interpreter, Franciscus Vallesius (*r*), and Hieronymus Mercurialis (*s*), had consider'd ; I could wish with sufficient success, and in every part :
“ Ruptures which happen about the pubes, are, for the most part, without
“ any immediate danger, but those which are a little above the navel, in the
“ right side, are painful, are attended with anxiety, and produce a stercora-
“ ceous vomiting ; as happen'd even to Plistacus.”

This passage you will see produc'd, in a dissertation (*t*) which has been learnedly and skilfully written, by that celebrated man B. Ignat. le Chauffe.

15. It now follows, that, as we have treated of true herniæ, we should go on to speak of the spurious likewise ; that is, of those in which there is no prolapsus of any part from the belly.

These are the hydrocele, the pneumatocele, hæmatocele, cirsocele, steatocele, sarcocele, and spermatocoele. But although these are many in number, I nevertheless shall not dwell long upon them all. For you have already had all the observations relative thereto, when examin'd by dissection, from Valsalva ; and most of them from me.

16. A hydrocele I have twice describ'd, from the observation of Valsalva, in the twentieth letter (*u*). In reading of which over again, you will readily perceive him to be the imitator of Malpighi (*x*). For both of them search into the nature of the fluid in the hydrocele, by the help of evaporation. Both of them press'd out some small drops from the tunica vaginalis ; and Valsalva moreover from the albuginea. From which, as he has left in writing on another occasion, even when every thing was in a very natural state, he saw little drops bursting forth, in a parallel order, upon compressing the testicle.

So also Malpighi had seen drops “ burst forth from regular orifices,” in the tunica vaginalis : “ by repeating the compressions frequently, others were

(*n*) Dissert. cit. thes. 5.

(*o*) Diatrib. de Enterocoele, c. 3. §. 4.

(*p*) Epist. 5. n. 19. & epist. 34. n. 11.

(*q*) De Morb. Popul. l. 2. f. 1. vers. fin.

(*r*) Comment in eam sect. n. 19.

(*s*) Adnot. in eum libr. n. 6.

(*t*) De Hernia Ventrali ad §. 10.

(*u*) N. 24 & 26.

(*x*) Epist. de Struct. Gland.

“ squeeze'd

“squeeze’d out; and among these almost innumerable drops, some were very “large.”

Wherefore, it was the opinion of both these authors, that a little moisture is secreted by the tunica vaginalis, in a natural state; and that this moisture serves to lubricate the surfaces of that membrane, and the albuginea, by lying betwixt them like a kind of dew, and preventing their coalition; so that by this means the testicle may be kept soft, and fit for performing its office: and if this humour is collected together by disease, that the hydrocele is then form’d.

Yet there are some persons at this time, who say that there is no cavity here, and no water in a natural state; notwithstanding they are not ignorant of Vesalius having nevertheless taught us (*y*), that the tunica vaginalis is internally “cover’d over with a kind of aqueous humour;” which, after him, was also seen by others at different times; and of Boerhaave (*z*) having added, that “having cut open the tunica vaginalis in a horse, a great deal “of water could be press’d out.”

But these things I do not hint at for this reason, that I think this the only way, in which the origin of a hydrocele may be explain’d. And even when I reflect upon all my observations with attention, I find none which does not show, that those hydroceles of the tunica vaginalis, which I have examin’d, had deriv’d their origin from hydatids being ruptur’d there.

And this will appear to you in the same light, I believe, when you observe that in each of them, some hydatids were still remaining; either in a perfect and entire state, or half-lacerated; or that some traces of them were visible.

But before I begin to give, or take notice of, these observations, it may be of use to know, that hydatids are sometimes found within this cavity; even when no hydrocele was yet begun: and if these hydatids burst asunder, and first pour out the water they contain; and after that go on to secrete still more and more; there is not the least doubt but they must produce a hydrocele.

And in the fourth letter to you (*a*), I have made mention of two hydatids in that part; both of which were lying upon the testes, one upon each; both of them large; yet in such proportion that the left was the largest; being loose and free on every side, and containing such a humour, as I did not see concrete when put upon the fire; but leaving a certain thin pellicle behind it, evaporate away; just as it has sometimes happen’d to Malpighi (*b*), and to Valsalva (*c*), in examining the water of the hydrocele in the same manner. But let us go on to those observations.

17. An old soldier, who was gibbous, being brought into this hospital, and dying there very soon after; it was impossible to learn what disorders he had been afflicted with, and what had been the occasion of his death, so much from the relation of the man himself while living; or from the observation of the physicians; as from his dissection after death.

The body, such as it was, was carried to the college, where I was teach-

(*y*) De Corp. Hum. Fabr. l. 5. c. 13.

(*z*) Prælect. ad Instit. §. 641.

(*a*) N. 30.

(*b*) (*c*) Locis paulo ante indicatis.

ing anatomy, in that very cold season which I have spoken of already (*d*); that is in the month of February of the year 1740.

The belly shew'd no preternatural appearance, if you except what relates to the scrotum; of which I shall speak hereafter; and something bony in the iliac arteries.

In both cavities of the thorax was a considerable quantity of water; in the pericardium not a little; being every where concreted by the frost. Yet the lungs; except that one lobe was connected with the pleura, for a considerable extent, and, at the first division of the bronchia, they had one bronchial gland, amongst a great number, of a very considerable size; shew'd no great marks of disease: nor did the legs and feet shew even any slight beginning of an œdematous tumour.

To the internal surface of the pericardium, which was thicken'd, and to the external surface of the heart, adher'd, here and there, a kind of thick and almost puriform matter: and this I suppos'd to be the more viscid and polypous part of that water, which, as I have already said, had been frozen within the pericardium.

When this matter was pull'd away from the heart, the fat, with which it was cover'd, every where, in great quantity, seem'd to be less eroded, as it were, in several places. But I did not suffer myself to be deceiv'd by this appearance, as I bore in mind those things which I had formerly observ'd; as I have sufficiently demonstrated to you, when I wrote the twenty-first (*e*), and twenty-fifth (*f*) letter to you: where I take notice, in a cursory manner, even of this soldier.

The heart itself seem'd to be larger than it naturally is, and the branches of vessels to be wider; particularly those branches of the great artery that are call'd subclavians and carotids. But the valves of the aorta were evidently enlarg'd, and the trunk itself, in that part which lies nearest to the heart.

Nor were beginning ossifications wanting here and there, in that part; and betwixt the internal coats were even small bony scales; which occur'd still more frequently beyond this tract, and particularly within the orifices of the left carotids; that is to say, of the internal, and external; and in the brachial artery also, at the flexure of the elbow, and beneath it.

The seven or eight upper vertebræ, of the thorax, were so plac'd, that the spine being there curv'd, and inflected to one side, as many of the ribs, of the same side, were prominent backwards, and made a gibbosity.

The cranium, as better heads were procur'd in the mean while, was not open'd.

It remains that I now subjoin what appearances I found by cutting into the scrotum a few days after. This part was found on the right side, both internally and externally; on the left side it was tumid. Under the thicken'd coats therefore, I mean the erythroides and vaginalis, and within the enlarg'd cavity of this latter coat, I found water of a brown colour inclining to yellow; half-concreted by the frost; in some considerable, but not very great, quantity.

When I examin'd the testis, which seem'd rather to be extended in its length,

(*d*) Epist. 13. n. 5

(*e*) N. 2.

(*f*) N. 24.

than to be thicken'd; and the epididymis, which certainly was longer than natural; I observ'd a kind of small fimbria to be hanging from the albuginea, where it invested the testicle, very near to the larger globe of the epididymis: and this fimbria I judg'd was to be consider'd as the relics of a ruptur'd hydatid; especially as, not far from this, I perceiv'd an entire hydatid protuberating from the same coat.

18. One of those male bodies, the principal parts of which I dissected at Padua, in the latter end of November of the year 1718, had one side of the scrotum somewhat tumid.

Between the tunica vaginalis and albuginea, of that side, I found a water of the colour of urine; but not in great quantity: the albuginea was unequal with very small tubercles: and I was led to suppose these to have been the remains of hydatids; which had burst asunder, and discharg'd their water; by seeing some hydatids, in the same coat, which were not yet quite burst asunder: and these hydatids I demonstrated to those who were present.

19. There was another male body, among those that I dissected at Bologna, in the spring of the year 1703, which had a hydrocele of a moderate size, on one side in like manner.

Those two same coats contain'd, betwixt them, a fluid similar to water in which fresh meat has been wash'd. And from the larger globe of the epididymis, a small hydatid was pendulous, by means of a slender and short filament. Through this filament pass'd a sanguiferous vessel of a much smaller size.

20. That in these three examples there was no great quantity of water, we may conjecture is to be, perhaps, accounted for from hence; that neither all the hydatids had burst asunder intirely; and they which had burst were small; nor had they continued to discharge a fluid long after their rupture.

But the last example will bring to your mind those things which I hinted in the thirty-eighth letter (*g*), of the origin of hydatids, pendulous, in like manner, from the testes of women. And as many things, that I have there said upon hydatids (*b*), are illustrated by those that I say here; so, on the other hand, those, if you read them over again, will contribute to the illustration of these.

Wherefore I shall here supersede the examples of those things which happen to hydatids, in other parts in like manner, as well as in the testicles of men. In which you may now, with me, observe the very same series of changes, from the observations before given.

21. And first I would have you call to mind, that, in the butcher (whose dissection I gave you in the twenty-first letter (*i*)) when within both the *tunica vaginales* was a yellowish water; the hydatids, which, I suppose, had pour'd out this fluid not long before, appear'd to me like vesicles made up of thick parietes; as if contracted into themselves, and therefore, almost solid, and of a fleshy colour: each of them being pendulous from the albuginea, near to the larger globe of the epididymis, by means of a peduncle; and just in the same place, on the right and on the left side.

And from hence; which I observe by the way; you will naturally con-

(*g*) N. 38. in fin.

(*b*) N. 35. & seq.

(*i*) N. 19.

ceive, what was that fleshy gland, as it were, which Vallisneri (*k*) has taken notice of, as hanging by its proper stalk, from the female ovary : and from so frequent an observation of hydatids, either in a fix'd or a pendulous state : both in the ovaries of women, and the testicles of men ; you will take a new argument of the similitude that there is betwixt both these parts, if we consider the subject in this general way. But from a vesicle that was almost solid, let us now go on to a tubercle, or corpuscle, which was already quite solid.

22. A herdsmen died in this hospital, after the middle of January in the year 1743. As I cannot certainly say what disorders he had been chiefly subject to, and by what disorders he was carried off, you will yourself conjecture them from the preternatural appearances that I found ; when the parts which belong to the belly, and the thorax, were dissected in the college.

The thorax ; for with this cavity I choose at present to begin ; had the lungs closely connected to the pleura, though in other respects sound : the heart was enlarg'd : and the great artery was not without a small bony scale, where it began to descend : the carotids were much thicker than usual, and the internal jugular veins were extremely wide ; especially that on the right side ; which, to appearance, being fill'd more with air than with blood, was equal to the thickness of a man's thumb.

When the belly was open'd, our eyes were attracted by the lower part of the intestine colon, on the left side, which was dilated with flatus ; and, for that reason, so forc'd out of its usual situation, that the curv'd part of this intestine was, in almost its whole extent, plac'd transversely in the umbilical region ; thereby laying great room for errors, if any should, from the seat of pains in that part, have suppos'd that not the colon, but the intestine jejunum, was the part affected thereby.

The stomach was very large, and very lax. In this cavity were contain'd many worms : the internal coat was wanting, for some space, on the left side, and on the posterior surface of the fundus ; and in that part which is very near to the pylorus, the beginning of a gangrene appear'd.

Where the omentum adher'd to the stomach ; in which place, in general, you certainly see very small glands of the lymphatic kind, if you see any at all ; occur'd some of the magnitude of a small bean. The spleen was six inches in width, two or three inches thick, a span and a half long, and of a very lax and soft substance.

Yet the liver was not bigger than it naturally is, and internally, in one half of it, was colourless ; whereas the other half was of a dilute yellow : and from this viscus, were sent forth three or four biliary ducts, than which I never remember to have seen any wider ; and in particular than one which would almost have admitted the point of my little finger.

No cause of this dilatation appear'd at that time : but I should, perhaps, have conjectur'd that a calculus had formerly stuck in the trunk, in which all these branches, according to custom, join'd ; if this trunk, which was in other respects large, had been, itself, also, of that width, which was requir'd in proportion.

In the cyst was a bile of a brown colour ; but this bile, nevertheless, gave

a tinge of a deep yellow: notwithstanding a great quantity flow'd out of it, when cut afunder, a kind of tough fæces still remain'd, fimilar to thofe which fubfide at the bottom of wine.

One of the iliac arteries was, in fome places, tortuous, in the fame manner that we fee the fplenic to be: and the fufaces of both thefe veffels, internally, were almoft rugous, and of a brown colour; except where one of thefe fufaces fhew'd in one particular part, a little whitifh fubftance, of the hardnefs of a ligament, not yet bony.

The bulb of the corpus fpongiofum urethræ, which is generally black internally, and externally, from the ftagnation of blood therein, contain'd none at all in this fubject; which I do not remember to have feen elfewhere; fo that the cellules of it, which were open enough in other refpects, were only half-red, and of a flefhy colour.

One of the teftes was in its natural ftate, except that, betwixt itfelf and the epididymis, it had a thin flap of fat interpos'd; whereas the man was not at all fat in other refpects.

But the other was furrounded with fuch a quantity of water, of a very yellow colour, that no fibres any more appear'd through the tunica crythroides; that is, in confequence of this being diftended by the tunica vaginalis; which was not only diftended itfelf alfo, but extended its cavity to the height of three inches above the upper part of the tefticle; though always decreafing in its width, the higher it reach'd: the teftis was indeed found; but fo produc'd in length, that it feem'd to have caus'd a diftraftion in the fibres of the epididymis, which was connected thereto.

Near to the larger globe of this epididymis, a roundifh corpuscle was prominent from the albuginea, that feem'd to be made up of the fubftance of this coat. The fafciculus of the fpermatic veffels was much thicken'd indeed; but was made up, in the greater part of it, of a yellowifh fat.

23. In this, and other obfervations, which I am about to point out, or produce, do not be furpriz'd, that, tho' there was a great quantity of water, or at leaft not a little, within the tunica vaginalis; yet there was often but one corpuscle, and that not large.

For it might be the remains of a large hydatid, one which had, for a confiderable time, difcharg'd water; although it had at length, for a long time paff, contracted itfelf into that ftate of fmallnefs: and if there had been any fimilar corpuscles befides, they might, fometimes, have intirely vanifh'd away.

Having given you this admonition, I will not only call back to your memory, the old man of whom I wrote in the fortieth letter (1); in whose tunica vaginalis, on one fide, was a turbid water, in confiderable quantity, and a roundifh corpuscle, of the fame colour with the albuginea, was prominent, near to the larger globe of the epididymis; but I will furthermore add, on this occafion, two other hiftories; one of which confirms that there may be, at the fame time, many corpuscles, and the other fhows, by what means they may fometimes efcape the eyes of the diffeftor.

24. An old man, whose occupation had been that of hufbandry, was carried off, in this hofpital, by a dropfy of the thorax, at the time I was about to

begin the business of teaching anatomy publicly; that is in the month of January, in the year 1731. His body was therefore brought into the theatre, and dissected in the proper order; notwithstanding I shall here also, as I did in the herdsman, describe those parts in the last place, that were first examin'd.

After the water was exhausted from the thorax, the lungs were found to be flaccid, and much diseas'd. But not to the heart.

When the abdomen was laid open, besides those things relating to the appendix vermiformis, the valvula Bauhini, the liver, and the spleen; which are sufficiently explain'd in the fourteenth anatomical epistle (*m*), and which there is no occasion to repeat here; the trunk of the great artery was found to be unequal here and there, in several parts of its internal surface; being either become quite bony, or inclining thereto.

And of the branches of the cæliac, that which runs up on the fundus of the stomach, was universally distorted in a surprizing manner (which I never saw before) as if into the form of crisp'd, or frizzled hair, frequently inflecting itself backwards.

The urinary bladder being contracted greatly into itself, thicken'd, and indurated, gave a resistance to the air which was blown into it; and could not be dilated thereby. Internally it was ting'd, round about, with a bloody-redness; as if from inflammation; but principally at the lower part: where, from the middle of the very circumference of the orifice of the urethra, from the internal, and at the same time, posterior surface, a protuberance was prominent within the bladder, of the shape and magnitude of a middle-siz'd grape.

And this protuberance, although itself was there red, from the distention of the sanguiferous vessels, was nevertheless made up, internally, of a white and compact substance, into which the prostate gland was evidently produc'd.

Finally, one of the testes was small, and contain'd within a great quantity of water; which had, in part, concreted into icy lamellæ, by the force of the cold. This water was contain'd within the tunica vaginalis. And from the albuginea; both where it invested the testicle, near to the larger globe of the epididymus, and where, producing itself, it cover'd this very globe; from each place, I say, a corpuscle was prominent; so that the two were very near to each other: and these were made up of a dense and hard substance.

25. A man, who had fallen from a high place, about the beginning of April in the year 1740, broke the bones of his head and thorax; as I shall write in a future letter (*n*). But at present, as he labour'd under a hydrocele on both sides of the scrotum, I will take this occasion to tell you what I saw in both places.

The *tunicæ vaginales* contain'd a limpid water: but not both in an equal quantity. For the cavity of one was either nothing, or but little, extended beyond its natural bounds: yet the cavity of the other was produc'd quite to the upper part of the os pubis; being gradually more contracted indeed, but still pretty wide, and interrupted with no cells, or fibres whatever.

Both the testicles were sound: although that which was contain'd in the

larger cavity, was considerably larger than the other. The smaller had a small tubercle, of the same colour with the albuginea, and fix'd to it, as if made up thereof, but not hard. The larger show'd nothing of this kind. But as I happen'd to observe that, while the water which had surrounded it, was discharged, a little body, of some kind or other, had come out therewith, I found, by looking into this water, a corpuscle of the bigness of a small grape, and of the shape also: except that this little body, inclining somewhat to the oval figure, had, in the middle of one extremity, a short and slender neck as it were; so as to resemble a very small bottle, or if you please a grape still furnish'd with a stalk: and that of the same substance with the grape.

And indeed this corpuscle seem'd to have adher'd, to some part, by this its neck, or stalk; and being shaken off, from some cause or other, to have fallen into the water, where it might easily have escap'd observation. The substance whereof it consisted, internally, and externally, was white, dense and compact; if you except a very small part of an irregular figure, which occupied the middle place, and seem'd to be a kind of nucleus. For this part was yellowish, and almost of a bony hardness; whereas every other part, when press'd betwixt the fingers, gave way in some measure.

26. It does not escape me, what you may principally object against those things, which I seem to myself to be at liberty to conjecture, from the observations that I have given you; and this even in dependance upon some of my own observations, which you have receiv'd at other times. For I very well remember, that in the twenty-fourth (*o*), the forty-first (*p*), and the forty-second (*q*), letters, I have describ'd testicles, wherefrom a roundish corpuscle was prominent, or even pendulous, which to me was a proof of an hydatid having been ruptur'd; whereas the tunica vaginalis, nevertheless, sometimes contain'd a little water only, scarcely any at other times, and even none at all at some times.

And against these observations, I am so far from being willing to make use of any subterfuge, that I am, moreover, willing to add others of the same kind to them; and then, at length, declare, why none of them is any insuperable objection to my conjectures.

27. Another man died in the hospital, a few days after we had dissected that body, of which I spoke last: he had been brought thither, under the most violent symptoms of an incarcerated hernia, as it is call'd; and too late for any assistance to be given him.

As I was absent, our Mediavia dissected the body: who, on the very same day, and soon after, related what he had seen; and, at the same time, took care that some parts, which I desir'd to examine myself, should be brought to me. Take first then what he related to me, that you may add it to what has been said above of the enterocoele; and after that I will tell you what I observ'd in respect of the hydrocele.

The sacculus of the hernia, being confin'd beneath the cremaster muscle, and the tunica erythroides, annex'd thereto, had the spermatic vessels, and the testicle, behind it. In the sacculus, the duplicated portion of the intestine ileum was slightly connected thereto; in such a manner that it could be se-

pared with the fingers: yet could it not be thrust back into the belly, by reason of the narrowness of the ring, and the dilatation of the intestine, from the included matter.

The ring was of a blackish colour, as the intestine was also; and not only within the sacculus, but even within the belly likewise, to the extent of half an ell. The rest of the intestines were not turgid, although the abdomen had been somewhat tumid in the living body. He was prevented, by the very filthy smell of the body, from touching any other parts of it, besides what he knew were expected by me.

The cranium being open'd, he observ'd the vessels of the meninges to be much distended with blood, and an extravasation of serum. What I observ'd in the meninges, it is not the place to speak of here.

It is proper only to speak of some things, which I saw in one of the testicles that was brought to me, and in its proper membranes, wherein it was even then included.

Within the tunica vaginalis, was contain'd a water of a slight yellow colour, but in so small a quantity, as not to exceed a third part of a spoonful. Nevertheless, from the tunica albuginea, where it invested almost the upper part of the testicle, which was in other respects sound; as the other parts that I examin'd likewise were; a roundish corpuscle was prominent, which was of the same colour with the coat itself, and seem'd to be made up of the same substance.

28. A man who was a native of Trent, of a tall stature, but not large in his bulk, died of a disease, which I have already given you an account of in a former letter (*r*); as I also have of a small bone being found in his heart; and of frequent bony laminæ in the great artery, (although in a cursory manner) for which reason I shall not repeat the relation here. I will rather add two things that I observ'd besides, in dissecting his body; in the month of March of the year 1717; that you may have his history as perfect as possible.

The ventricles of the heart, and the large vessels, were not without poly-pous concretions; and those large, and dense bodies, and such as, if you attempted to draw them asunder, gave a considerable resistance: and yet so great a quantity of fluid and black blood, overflow'd in every part of the body, that it was often the occasion of great hindrance, and trouble, in the dissection.

In one part of the scrotum the tunica vaginalis did not contain a great quantity of water. But the surface of the albuginea, which was much thicken'd, was beset, here and there, with corpuscles of the same colour with that coat; of the shape of very small glands; hardish in their substance, and, in some places, dispos'd almost into the form of a quincunx.

29. The body of a man, who was said to have died of a kind of pleurisy, was brought into the college, when I was teaching anatomy there, about the end of January, in the year 1750.

The thorax being open'd, a real complication of diseases was found therein. For there was a great quantity of water both in the cavities of the thorax, and of the pericardium: the lungs, and particularly on the left side, were in great

measure affix'd to the pleura; and in some places a little hard: among those glands which are at the first division of the bronchia, was one of more than an inch in length. I purposely omit here, what I shall say with more propriety on another occasion; I mean that the triangular muscles of the breast were almost wholly deficient; and this from the original formation: and that, from the side of one of the fibulæ internally, at its upper part, a bony process, very similar to the styloid, had been prominent.

But I will not omit these things, for the sake of which I began, principally, to write this observation. The common coats of the testes being taken off, under that coat which is properly call'd the scrotum, I saw more fat, and even at the lower part, than I should have expected; particularly in a man who was not very fat in general: and when I cut into the other coats on one side, I did not observe any moisture to flow from the cavity of the tunica vaginalis: yet the included testicle had, near its upper extremity, a small redish excrescence, prominent from the tunica albuginea.

30. After what I have already said, it is to no purpose to add the circumstance of the young man, of whom I shall speak, in treating of the wounds of the thorax (*); and much less of the man whose history I shall give, when upon the subject of the gonorrhœa (†); although the former of these had in one testis, near to one of the globes of the epididymis, a small, redish, and soft, excrescence of the albuginea, as it were; and the latter a roundish tubercle, at the upper part of the epididymis; yet neither of them had any larger quantity of moisture within the tunica vaginalis, than may be seen even in the most healthy man.

For now it sufficiently appears, from the preceding histories, that not only when one corpuscle was present, and even when many were observ'd, there was no great quantity of water in the tunica vaginalis; but also that there was none when a redish excrescence was still prominent: though this excrescence, not long ago, was consider'd, by me, as the token of an hydatid being ruptur'd.

Notwithstanding this is the state of the question, as there is nothing which forbids us to conceive, that the hydatid lately ruptur'd was very small, and that some, or many corpuscles, are the traces of old hydatids; and finally, that the orifices of the absorbent vessels; as in the tunica vaginalis of some persons, they are very few in number or obstructed, for which reason the extravasated water is long preserv'd in them; may on the contrary exist in other bodies in a very great number, and be more open; since therefore we are at liberty to conceive these things; I do not see that there is sufficient reason to oblige us intirely to set aside those former conjectures.

But be this as it will; from reading the observations that I have now propos'd, and from turning back to those which I have refer'd you to, you will gather that hydatids, excrescences, and corpuscles, have occur'd to me, for the most part, at the upper extremity of the testis; and even near the larger globe of the epididymis: and that when they were prominent in both the testicles, they occupied the same place in both very frequently; and indeed that the hydatid, of which I have taken notice above (‡), as resembling the

(*) Epist. 53. n. 40.

(†) Epist. 44. n. 5.

(‡) N. 3.

testis in figure and magnitude, was even form'd thereupon, or at least very near to it; as far as the delineation seems to show: which things are, perhaps, not unworthy of observation, as their causes may probably be inquir'd after, in the very near insertion of the fasciculus of the spermatic vessels.

But I suppose you will rather inquire of me, whether I never found the hydrocele any where else, but betwixt the tunica vaginalis and albuginea. And I will immediately explain to you, how it appears to me, that I saw it once, in the tunica albuginea itself.

31. An old man, who had fallen from a high place, in the month of March in the year 1706, died of a blow on his head receiv'd by the fall; for which reason you will have the remaining part of his history, when I treat of those blows (*u*); at present I shall only give you an account of what relates to the double hernia, under which he labour'd in one side of the scrotum only, and in the right.

The omentum, which was drawn towards the right side, even in the cavity of the belly, descended from thence into a sacculus, which was carried down at the side of the fasciculus of the spermatic vessels; but not extended beyond the upper part of the testicle. Internally it was smooth; and from thence the omentum was very easily brought back into the cavity of the belly.

The other hernia appear'd in the following manner. There was another sacculus much less than the former; that is to say not longer than the testicle, yet sufficiently wide; consisting of a smooth and separable membrane, and containing a yellowish water. This sac surrounded much the greater part of the testicle, in consequence of having its sides closely join'd, on one hand, and on the other, with that part of the back of the testicle, which was on each side, plac'd nearest to the epididymis longitudinally; so that this small part was wholly on the outside of the sac.

32. As I have, more than once, separated the tunica albuginea into two membranes, by an easy, and equable division (*x*); and as I see, that the celebrated Teichmeyrus (*y*) very freely increases this separation, and affirms "that it may be divided into three evident coats;" I should suppose that this lesser sacculus was made up of two of them, by the interposition of water: which kind of hydrocele is, as far as I know, not observ'd by any other author; unless you, perhaps, suppose it to have been hinted at by our Fabricius (*z*).

But that species of this disorder, which men, in other respects learned, assert to be very frequent; and which I acknowledge, not without a method of cure; in that introduction (*a*), which is so ancient, as to be ascrib'd to Galen; that species, I say, has not ever occur'd to Valsalva, nor to me, nor to the very experienc'd Heister (*b*).

Yet I would not, for this reason, deny, that it has even been seen very frequently by others, who, without doubt, much more frequently describe water as shut up within the membranous cells, that are above the tunica vaginalis, than as extravasated within this cavity.

(*u*) Epist. 52. n. 8.

(*x*) Advers. 4. animad. 1.

(*y*) Vindic. quorund. invent. in fine.

(*z*) Pentateuch. Chir. l. 1. c. 27.

(*a*) C. 18.

(*b*) Dissert. de Hydroc. n. 28. & Instit. Chir. p. 2. f. 5. c. 122. not. *b* ad n. 1.

It is long ago, that others, and among these Gerard Blasius (c), have admonish'd us, that this coat "does not extend itself beyond the testis; and "that the spermatic vessels are not cover'd with any loose tunica vaginalis: " but that, instead of this, a great number of membranes are given, "which are condens'd together, and by this means connect these vessels:" when the peritonæum, therefore, is ruptur'd in the groins, there is, says he, "no passage allow'd, for any thing to flow down from the belly, to this "space; that is into the cavity of the tunica vaginalis; but, in fact, be- "twixt this coat, and the scrotum itself:" that is into the cells which lie betwixt the two, and communicate with those superior cells, either naturally, or from the effect of disease.

All these opinions are follow'd by many now, nor do I deny them; nor yet what they add, I mean that by the weight, or acrimony, of the humour collected in those superior cells, that kind of membranous septum, which is interpos'd between the cavity of the tunica vaginalis, and those cells, may sometimes be ruptur'd, or eroded; and the humour, by this means, be pour'd out, at length, into that coat: and thus one continued cavity will be produc'd; that is to say, of the tunica vaginalis, and the space which those upper and distended cells occupied.

In this manner they will probably explain that observation of mine (d), of the vaginal cavity being produc'd quite to the os pubis; and indeed I shall not be very obstinately repugnant to such an explication: although I do not very well understand, how it agrees with that, which not only is allow'd by others, but by themselves also; I mean that the hydroceles, like other spurious herniæ, "seem to increase, as they ascend upwards towards the groins;" contrary to what the true herniæ do, which "increase as they descend towards "the testis."

But if they also explain, after the same mode, another observation of mine (e) on the herdsman; the cavity of whose tunica vaginalis ascended three inches above the testicles; or even some of that great number, wherein this cavity being not more produc'd upwards than usual, contain'd more or less fluid; it will be surprizing that not any one cell was ever left above the tunica vaginalis, that I have seen to be distended with a fluid: and even that when this septum is not ruptur'd, the humour has nevertheless pass'd into the tunica vaginalis; of which they deny the possibility.

Wherefore, if I am to relate, with faithfulness, only those things that I have seen (according to my usual custom) in this place also; I have no where seen a fluid collected in the scrotum, except in the cavity of the tunica vaginalis; if, besides the old man of whom we last spoke, you except the ascitic patients, in whom, however, it was separated into those small cells that are immediately under the skin, as has been explain'd in the thirty-eighth (f) and forty-first letters (g).

33. This hydrocele of ascitic patients, which they rather call a dropsy of the scrotum, it is by no means necessary to account for, with the vulgar, from that water wherewith their belly is distended; as the same causes, from whence the water then very often stuffs up the rest of the cells that lie under

(c) In Observatis, supra ad n. 8. citatis.

(a) Supra n. 25.

(e) Supra n. 22.

(f) N. 26.

(g) N. 18.

the skin, may very easily cause them to be fill'd in the scrotum likewise; and that so much the more easily, as this part is pendulous, and endow'd with but little muscular strength.

Yet I shall not deny that, sometimes, by the great quantity of water, which forces against the peritonæum, this membrane may be so impell'd within the scrotum, that if you perforate this part, the water, descending thither from the belly, may burst forth with great impetus; as that very ingenious man Benevoli (*b*) relates that he had seen.

And as he says that the ring of the abdomen was then so dilated, as to be able to admit a fist; it affords me a handle for putting you in mind, that it is not allowable to make use, or at least always, of a certain ingenious explication of the origin of the true hydrocele, in patients who have an ascites, "from the oblique muscle being too much stretch'd," on account of the tumour in the belly; "and its orifice being by this means made narrower;" that is to say, the oblong fissure which is generally call'd the ring, from whence the spermatic veins, which pass that way, are compress'd.

34. However, the pressure of those veins is, sometimes, to be easily accounted for, rather from the very great weight of the incumbent waters, while they pass under the peritonæum; and how much effect this pressure may have, in producing a hydrocele, I would show, if there were occasion, by the example, in particular, which you will read in the writings of the celebrated Bassius (*i*), I mean an example of a large hydrocele, which follow'd the use of a bandage, that very closely and strongly compress'd the groin; and that in a short time after.

Yet I knew an old physician, who, in order to intercept a defluxion of humours, as he call'd it, to a tumour of the testicle, which was already considerable, had order'd astringent medicines to be applied to the groin; as if it were in the power of these applications to astringe the artery, that carried in the blood, and yet this without astringing the veins, and the lymphæ-duets, so much the more in proportion, as their coats are more infirm.

When the apothecary who consulted me had heard these things from me; for the patient I speak of was an apothecary; he immediately remov'd these applications: and the other remedies made use of were of more advantage afterwards. And to omit the other causes here, let us consider only the spermatic veins in an hydrocele, and most other spurious herniæ; for these are, of themselves, sufficiently prone to generate, and increase, these disorders, whether you attend to their position, or their very great length, from their beginning quite to their end; or the more inert blood which they bring back, in consequence of its being depriv'd of its more thin, and active, particles in the testes; or the remarkable smallness of their fellow-artery, and its very long course; or the weakness of the cremaster muscle that lies upon them; or, finally, the valves in the veins themselves being few, or none at all; or perhaps unequal to their offices; as appears from injections made towards the testes: particularly in those who have dilated these veins, by being too intent upon venery, or venereal ideas.

(*b*) Dissertaz. 1.

(*i*) Dec. 1. Obs. Anat. Chir. 9.

From these causes then, which are sufficiently allow'd of by learned men, and yet which are requir'd for a proper secretion of the semen, these veins are so far fitted to bring on those disorders that I have refer'd to, or increase them; that if an intemperance of venery be added, if a compression, or a blow, or any thing else take place, from whence the motion of the blood, through these vessels, may be more retarded, these disorders may easily be the consequence; not to say that if these circumstances are not avoided, they may be increas'd.

And I even see, that, from this retardation, the explication of an observation, of Dodonæus, is deduc'd by a very learned writer; which observation is even related in the Sepulchretum,* in the next section (*k*), and quoted in this (*l*); that is to say, of a hydrocele, when it is from an internal cause, always occurring in the left part of the scrotum; or, at least, as Hildanus (*m*) has contracted that observation, "for the most part."

For as to what they took notice of, in regard to the left spermatic vein; as if it could carry the serum into the scrotum, from the neighbouring kidney; though it has no place in our consideration at this time, yet this is very well substituted in its room: that the blood is not carried back with ease and expedition, from that vein, into the emulgent.

But as to the example which is produc'd to explain the impediment; as, for instance, if the neighbouring kidney labours under calculi, sand, and ulcer; and a very small calculus be carried from the ulcer, with the blood, into the emulgent veins, and from this fall into the spermatic, and disturb the reflux of the blood from the testes; this example, I say, is so rare in an hydrocele, that he who proposes it does not disavow, and even requires from others, a more probable cause of this very frequent circumstance; I mean of that which appears from his observation, at least, that this disorder, occurs "far more frequently" in the left, than in the right side of the scrotum.

But to me it seems that no other cause need be inquir'd after here, than that which has been already acknowledg'd; agreeably to the opinion of some of the most learned men (*n*); from whence the left kidney is more subject to calculi, than the right.

For as the blood is not carried so speedily, and expeditiously, into the vena cava, through the left emulgent vein; in consequence of its being longer, and lying transversely over the great artery; as it is through the right; and the left spermatic vein does not, like the right, open into the cava itself, but into that left emulgent; it appears pretty clearly, that where the blood is equally prone to stagnation, in both the spermatic veins, it will nevertheless more easily happen that it stagnates in the left; or at least ascends more slowly; than in the right.

Nor should I assign any other reason, why the cirsiocèle "almost always affects the left side," according to the observations of Arantius (*o*): though, at the same time, I leave it entirely undetermin'd of these, as I do also of those that I mention'd above of the hydrocele, whether they answer equally with other observators. For it would be necessary that a greater number of

(*k*) Sect. 30. in Schol. ad obf. 1.

(*n*) Epist. 40. n. 12.

(*l*) In Schol. ad §. 3. obf. 21.

(*o*) De Tumor. p. n. c. 51.

(*m*) Cent. 4. Obf. Chir. 66.

observations, of most of these observers, should be collected, in regard to this circumstance, in both the diseases; and in those that Valsalva and I have made, it unfortunately happens to have been but very seldom remark'd, on which side the observations were made.

35. But before I add a few things of the cirsocele, I shall hint still fewer things of the pneumatocele, and of the hæmatocele, as the order propos'd (*p*) requires. For this last I have never seen, as it is seldom of long continuance like the rest.

For when blood, either from a wound receiv'd, or from any curative method, has flow'd down into the scrotum, surgeons immediately open a passage for its removal; following, therein, not only the precept of Celsus (*q*), but of reason itself. Yet sometimes from the erosion of the membranes of the testicle, "a remarkable quantity of bloody ichor" distends the tunica vaginalis; so that when this membrane is incis'd, "it bursts forth with impetus," as I find in Justus Schraderus (*r*).

But if we take the word pneumatocele in such a sense, as to suppose it owing to air being included in some intestine, which has descended into the scrotum; a remarkable example of which kind has been produc'd by the celebrated Haller (*s*) in particular; I have perhaps in some measure seen it: but if from air distending the cells of the scrotum, in which manner most authors understand it, I do not remember to have read that any one has seen this, without an emphysema, of all the other parts, or most of them; or, at least, as you have it in Palfin (*t*), of the parts nearest to the scrotum. How it appear'd to me in the scrotum alone, in a body already dead, you have in the fifth letter (*u*).

36. The cirsocele is the only one of all the different species of herniæ, that Cornelius Celsus has given the name of *ramex*, or *ramices*, to; whether it occupies the scrotum; and that either externally or internally; or, at length, whether it only fill the groin: and as he proposes this order not in the seventeenth, but the eighteenth chapter, of the seventh book; so he follows it, by treating of the cure, in chapter the twenty-second, and twenty-fourth.

And this remark I was willing to make, lest, like a man in other respects very ingenious, you should be in some doubt about the term *ramex* in Celsus; and this his last chapter should seem obscure to you: in which it is true he gives us the method of cure in the bubonocoele, as the conclusion of the eighteenth chapter teaches; but of a bubonocoele which has its origin only from varicous veins.

Justus Schraderus is obscure; whom I the more readily mention to you, because I see that his observations are omitted in the Sepulchretum. For in that very observation which is pointed out a little above (*x*), wherein he speaks of a certain hydrocele, he asserts that there were also "innumerable flexures" of creeping vessels immoderately turgid; but whether "on the surface" of the testicle, or the tunica vaginalis, is uncertain from what he says: for

(*p*) N. 15.

(*q*) De Medic. l. 7. c. 19.

(*r*) Dec. 2. Obs. Anat. Med. 1.

(*s*) Ad Prælect. Boerh. §. 641. not. *u*.

(*t*) Anat. du Corps Hum. p. 1. tr. 2. ch. 18.

(*u*) N. 19.

(*x*) N. 35.

that these appearances may be in either place, Celsus has taught us in the eighteenth, and twenty-second chapters, already quoted.

Moreover, as in the observation of Schraderus, so I observe, that it has frequently happen'd in others likewise, that herniæ of different kinds were join'd with the cirsocele. Turn to Horstius whom you have here in the Sepulchretum (*y*). And even read over again the passages of my letters, wherein this hernia is describ'd, as it was seen by Vallalva, or by me.

The first-mention'd author (*z*), having seen, according to the first mode of Celsus (*a*) "the varicous veins so entangl'd with each other, upon the scrotum itself," as to resemble a chain; found a hydrocele at the same time. And I having, according to the last mode of the first division of Celsus (*b*), found an incipient cirsocele in the butcher (*c*), or a compleat one in the potter (*d*); I, at the same time, found in this last, the beginning of a hydrocele; and in the former a compleat hydrocele.

Besides, the substance of the testis was so compact in the potter, that it seem'd, as Celsus says upon that mode of disease (*e*), "to have lost its nourishment;" and had a very small bony body lying beneath it: and this brings back to my mind, another particular observation of Vallalva, which was made on I know not what man.

For in the right fasciculus of the spermatic vessels, he found a bony body within peculiar little membranes: which, when he press'd it betwixt his fingers strongly, he saw to be made up of two bones. Both of these were of a globular figure; but one of the bigness of a grain of millet-seed, the other of the bigness of a vetch; the latter in part roughish, but the other elegantly smooth, or polish'd, like pearl.

However, Arantius (*f*) observ'd these things of a cirsocele, describing a very large one I suppose: "the vessels offer themselves to the touch in a turgid a state, as to equal a finger in thickness; being wrap'd up in circles, and folds (after the manner of the intestines) which in part disappear when the patients lie down, are diminish'd and become less troublesome, in the winter-season, when the scrotum is contracted; but are exceedingly so in the summer."

37. The steatocele is, with the same author (*g*), "where a certain adipous humour concretes in the scrotum, and about the testis." And he has follow'd the ancient writer of that introduction, which is preserv'd among the books of Galen; which writer having, in the seventeenth and eighteenth chapters, mention'd the steatocele among other herniæ, speaking of the cure, in the last-mention'd chapter, says that "the fat must be remov'd."

But whether we choose to call it a sebaceous matter, or fat; whatever of an unctuous nature is sometimes form'd within the scrotum, and distends it, that is certainly either collected under the skin itself, or in the internal cells.

To the first kind belongs that of which I have said above (*b*), that I had seen, under the scrotum properly so call'd, more fat, and even at the lower

(*y*) L. 3. sect. 29. obs. 17.

(*z*) Epist. 20. n. 24.

(*a*) L. 7. c. 18 & 22.

(*b*) Ibid.

(*c*) Epist. 21. n. 19.

(*d*) Epist. 7. n. 11.

(*e*) Cit. c. 18.

(*f*) C. supra ad n. 34. cit.

(*g*) Ibid.

(*h*) N. 29.

part, than I should have expected; particularly in a man not very fat: for there is no fat in that part, or at least but very little; and this only sometimes.

But that was a kind of beginning only of this disorder; which you see compleated in this twenty-ninth section of the *Sepulchretum* (*i*), from de Graaf: and to the same class, probably, is to be referr'd that which is to be read of, in the same place (*k*), in the observation of Horstius already taken notice of: "an adipose flesh in the right part of the scrotum."

And to the internal cells belongs that which, as was said above (*l*) for another reason, was found by the celebrated Petschius (*m*) in a body that was very fat; when that which seem'd to be an enterocele, or epiplocele, in one side of the scrotum, was nothing but "fat collected in the cellular substance of the peritonæum, and passing down through the rings to the scrotum."

Thus, in Boerhaave (*n*), you will read that a very large tumour was seen by him in the scrotum; for in a fat man "the luxuriant fat had pass'd through the ring into the scrotum, with the spermatic vessels; the testicle being quite found and free."

And Schulzius (*o*) seems to have found "a large quantity of fat" not below the groin, and on the right side, a much less quantity being on the left, and "closely interwoven" with these vessels; so that, at first sight, it resembled an intestine, or the omentum, prolaps'd thither: and that in a carcase rather lank and thin, as you will remember to have been related by me before (*p*), in order to illustrate a different circumstance.

To me, however, who know that I have sometimes seen fat interpos'd, here and there, betwixt these vessels, even in a lean body, from the upper part of the tunica vaginalis quite to the ring; for I particularly observ'd this tract at the time; and that in a very brawny man, by no means fat, who was kill'd when in perfect health, I not only found fat in the lower part of the same vessels, but also betwixt the epididymis, and the testis; and finally, that in the herdsmen, spoken of in this letter (*q*) (who was not fat likewise) where the thicker fasciculus of them, which belong'd to one testis, was made up of fat in its greater part, fat was not wanting betwixt the other testicle and its epididymis (which circumstance, although, as far as I remember, not taken notice of by anatomists, is perhaps not uncommon); to me, I say, it does not seem so surprizing, that fat has been, more than once, found immoderately increas'd in the fasciculus of those vessels, as that it has never been found betwixt the epididymis and the testicle; unless, perhaps, fat has been, at any time, taken for flesh, in any kind of sarcocele.

38. For the author of the "Introduction" (*r*) just now quoted, takes notice not only of red flesh, but even of flesh "of a whitish colour;" as composing a sarcocele; and I myself, as I have said in a former work (*s*),

(*i*) Obf. 14. §. 2.

(*k*) Obf. 17.

(*l*) N. 10.

(*m*) Syllog. anat. obf. §. 89.

(*n*) Prælect. ad Instit. §. 712.

(*o*) Act. n. c. tom. 1. obf. 225.

(*p*) N. 10.

(*q*) N. 22.

(*r*) C. 18.

(*s*) Advers. Anat. 2. Animad. 6.

have seen sacculi of fat, which, as this fat was ting'd by stagnating blood being intermix'd with it, resembled flesh.

Moreover, in regard to the nature of this hernia, and its situation, different physicians have entertain'd different opinions; and those immediately repugnant to each other. For Vesalius, as you will learn from the *Sepulchretum* (*t*), had persuaded himself that it consisted of the omentum prolaps'd into the scrotum.

Some have thought that it did not differ from the tumefaction, and induration, of the testicle. But the others; although they do not deny that less cautious observers may sometimes be impos'd upon by the first of those disorders, so as to take it for a sarcocele; by this name, nevertheless, understand a flesh really growing out about the testicle, and its vessels, or some other substance of that kind.

Yet this seems to happen "very seldom," as Celsus (*u*) has admonish'd us; or at least less often than is generally suppos'd; if we look for observations which are not liable to doubt: and perhaps Olaus Borrichius does not seem to have wander'd far from the truth, when he remark'd, upon his own observation, as you have it in the *Sepulchretum* (*x*), "that a sarcocele is not so frequently form'd upon the testes, as in them:" where he has also shown how a hydrocele may sometimes resemble a sarcocele; so that, perhaps, it was the former, and not the latter, which they believe to have been taken away by the powder of the root of ononis or rest-harrow; which certainly increases the quantity of urine.

He has, therefore, prudently attributed so much to that opinion, which I mention'd in the second place, as, nevertheless, expressly to leave room for the third also, for which he shows, that the examples, in Lotichius, and Hil-danus, argue. Looking for these examples, I easily found them in the sixth of the *Consilia* of the first-mention'd author (*y*), and in the fourth *Centuria* of the observations of the latter; and wonder'd that nothing was transfer'd into this section of the *Sepulchretum*, from the sixty-fifth observation of this author.

But if those things which were thoroughly examin'd by anatomy were sought after; there was an observation of Blasius (*z*), that might be refer'd to this class; in which, not as in that of Borrichius, the whole fleshy mass was nothing but the testicle itself; but, on the contrary, the testicle was contain'd, like a nucleus, in a thick cortex as it were, which seem'd to be made up of pretty hard glands.

I however, though I do not at all doubt, but a morbid flesh may grow out from the coats of the testes, when eroded, from whatever cause it may be; as well as from the coats of other parts; have never yet lit on an appearance of this kind in dissections.

But the celebrated Pohlius (*a*) has lit on such an appearance, and has said that a sarcocele is, "according to his own observation, a fibrous and fleshy tumour of the testicles; more or less hard and painful, and form'd by degrees; which either increases the whole substance of the testicle, and con-

(*t*) Sect. hac 29. obs. 15. §. 3.

(*z*) 15. Partis 1.

(*u*) L. 7. c. 18.

(*a*) Progr. de Hern. & Speciatim de Sarcocele.

(*x*) Sect. cit. Schol. ad obs. 22. §. 1.

(*y*) C. 3. obs. 9.

“verts it into a mass like flesh; or, at least, growing to a part of it, forms a kind of fleshy excrescence as it were.”

Nevertheless you see, that he acknowledges it to be principally in the whole of the testicle: and he produces an example of a *sarcocele* dissected by him, in which the substance of the testis, “had been universally chang’d into a purulent matter.”

And if you read those observations, of that very experienc’d man *Dietericus Sproegelius* (*b*), wherein the *hydrocele* is join’d with the *sarcocele*; as a cause, or as an effect; you will see that the testicle was found to be “livid and black, putrid,” or “extended, hard, and, on the outside, together with the epididymis, corroded and callous;” or “partly friable by means of putrefaction; but in part perfectly cartilaginous, and having the tunica albuginea also, together with the epididymis, universally cartilaginous;” or finally “tumid,” and having, when it was dissected, “a true yellowish thick pus in the middle, with an erosion and incipient callosity of the parietes.”

In no more than one observation (*c*), is it said that “tumid and scirrhus glands” were found;” but not in the substance of the testicle: were they then upon the surface of the testicle? Or in the spermatic rope? For in this they also acknowledge a *sarcocele*, and do not at all treat of it, if it has enter’d into the belly, like that which I have describ’d, as seen by *Valsalva*, beginning in the testis (*d*), and ascending thither, like a hard tuberosity, as if of a glandular nature, where it was join’d with a very large and similar tumour of the mesentery.

But not to digress from the subject of *sarcocele*, when enquir’d after in the testes themselves, the observations of that illustrious man *Heister* (*e*) are excellent. This author found four testicles such as he delineates (*f*), all of them so immoderately enlarg’d, that he, with justice, refuted the opinion of those (*g*), who have asserted that a *sarcocele* “never exceeds a hen’s egg in its size.”

He also found them all scirrhus, and of an equal surface; so that it was not without reason he affirm’d (*b*) “scirrhus testicles to be far more frequent, than excrescences from the testicles.”

The remaining circumstances you will see in this author himself; and among others, that one of those testes (*i*) was “corrupted, and, in a manner, cancerous.” In the mean while, let us go on to the last of the herniæ enumerated by us.

39. By the name of *spermatocele*, the author of the twentieth observation, in this twenty-ninth section of the *Sepulchretum*, has understood a hernia, which is made by “the vas deferens being “corrugated, and going down “into the scrotum;” but very easily returning within the belly, either by the help of the hands, or a supine posture of body.

Who this author was, I enquir’d, by looking under the observation, to no purpose; though I much wish’d it, that I might better be able to conceive his meaning. For under it is written *idem ibidem*; that is to say, either

(*b*) *Observ. quædam select. §. 50. & seq.*

(*c*) §. 51.

(*d*) *Epist. 39. n. 2.*

(*e*) *Dissect. de Sarcocele.*

(*f*) *Fig. 1. & seq. cum. explic.*

(*g*) *In Proemio.*

(*h*) §. 37.

(*i*) §. 34.

Rolfinck, or Riolanus, or Hildanus, or Roscius; for these had all been mention'd in the preceding scholia, and observation.

I knew, however, that those were not the words of any of these authors: and it happen'd, by mere accident, at last, that, turning over Barbette's surgery (*k*), I lit upon these very words; and did not find any thing more than what is copied in the Sepulchretum.

It is certainly difficult to be understood, by those who are not ignorant how the vas deferens is connected, by adhering to the bladder, and lying upon the ureter in its passage (from whence Ruttj (*l*) accounted for the drawing up of the testis in nephritic pains) and finally, how it is tied down, by very frequent cellular membranes, to the neighbouring parts, not only above the ring of the abdomen, but beneath that also, quite to its origin; it is difficult, I say, to be understood, by those who know these circumstances, how this vas deferens can possibly descend so far into the scrotum, as to produce a hernia, by its being wrap'd up together there.

And as I do not remember that this has been seen by any one in dissection; and as Barbette does not say that he saw it by these means; I think there is room to suspect that what he says he had more than once seen, was quite a different thing from that which he has suppos'd it to be.

The spermatocele therefore; which, if it signified to me what it did to Barbette, ought to have been consider'd above, in the number of the true herniæ; is retain'd among the spurious herniæ; and so understood, as to signify "a collection of semen in the testicles," which sometimes "raises them up to a very great bulk:" and I use the words in which the compilers of the "*Bibliotheca Anatomica* (*m*), have propos'd this subject; requesting that they might be allow'd to call herniæ of this kind, "spermatoceles:" for this signification, and still less this word, was not lately made common among physicians, as a man, in other respects very learned, seems to imagine.

And indeed these compilers have affirm'd, that the case has been "more than once" remark'd by them, in men of a very salacious disposition, when there was "an obstruction form'd in some part of the epididymis, from the particles of the semen that are capable of concretion;" and that they had once seen the case, beyond all possibility of doubt, when, after the effusion of the semen, thus confin'd, into the scrotum, an abscess having arisen from thence, which was under a necessity of being open'd with the knife, this abscess, when cleans'd, did no more discharge pus; but from that part of the epididymis, which is in the middle betwixt the globes thereof, the semen, which had burst through that part, by distending it, very evidently came forth.

But if you choose rather to attribute this foramen, of the epididymis, to the eroding matter of the abscess, than to the distending semen; you nevertheless cannot deny what is dictated by reason itself, if the passage of the semen, into its vesicles, be intercepted from any cause whatever; or if the return

(*k*) Part. 1. c. 7.

(*m*) Tom. 1. in adnot. ad Graaf. Tract. de

(*l*) Treatise of the urinary passages, sect. 3. Viror. Organ. & cæt.

of it, by the absorbent vessels, into the blood, from the vesicles that are already distended, be prevented; I mean that the testicles themselves, the epididymis, and the other receptacles of that fluid, will be so fill'd by the new semen which is continually secreted in the testes, that at first they become swell'd; at which time I will say that there is a spermatocoele; then after this, that the very tender and soft structure, which is peculiarly observable in the testicles, will be, by degrees, vitiated: and the vessels which carry the semen, blood, and lymph, being ruptur'd, at length tumours of a mix'd kind will be generated in the testes.

Now I will give proofs of these things from examples.

40. Some persons, whose ilia were distended with flatus, have complain'd to me, not so much of a tension, and pain, as of one, or of both testicles being for the most part tumid, in particular, when the flatus was most troublesome; not the least inconvenience remaining when the flatus was dislodg'd.

I suppos'd therefore that the passage for the semen was shut up by the distention of the intestines; the vessels that carry this to the *vesiculæ* being compress'd, and even the vesicles themselves sometimes; so as not to admit what was brought down to them.

Thus I also remember, that, thirty years ago, when one Rhodigi, a man of credit and reputation, came to me (being subject to a certain tumour, which had return'd more than once, betwixt the muscles of the abdomen, in the right epicolic region) and said, that as often as the tumour was present, the testes below that became very disagreeably heavy, so that he was oblig'd to receive the scrotum in a bag, and sustain it thereby; I remember, I say, to have explain'd the case to the patient, and the physicians, (who were present with me in consultation) even at that time, in such a manner, as to say, that when the oblique muscle, on the right side, was stretch'd in consequence of the tumour, with which it was affected, and the oblong fissure thereof, which is call'd a ring, of course constrict'd; it was not to be wonder'd at, if the tube which carries the semen, and passes through this fissure, being in some measure stricte'd, the ascent of the semen be, in some measure also, prevented.

Yet in this man, and in the former likewise, it may perhaps be; notwithstanding there were no proofs of the blood stagnating; that the spermatic vein being equally compress'd, or streighten'd, these symptoms which I have spoken of, were no less to be attributed to the obstructed blood, than to the obstructed semen.

And there is, among the letters of Valsalva, one which was written to a certain prince, one of whose testes had, after marriage, grown out to the bigness of a hen's egg.

Valsalva imagin'd that this tumour might be from the stagnating semen, and not without reason; because the patient was not wont to emit his semen with ease, though in other respects he abounded therewith: so that sometimes he was oblig'd to desist from the venereal congress, without having made it compleat.

In like manner, in a youth of whom Hildanus gives the history (*n*); the summary of which is in the scholium on that observation of Barbette, to

which I have refer'd (o), in the Sepulchretum; who would account for the pain of the groins, and the tumour of the testicles, not from semen, but from blood; as they had been the consequents of the ejaculation of semen being suppress'd, after having been about to be thrown out?

Both of these tumours vanish'd on the left side indeed: on the right, however, the tumour not only continued, but, in process of time, grew out into a very large fleshy hernia. The same thing would have happen'd to another man, from the same cause, if the celebrated Crause (p) had not, by a very extraordinary success, resolv'd a tumour, which had already increas'd to the size of a large human fist, within two years.

But what was the event of a tumour of the same kind, and arising from the same origin, which I saw in a man of noble birth, I cannot learn: for I have heard nothing of him since he just consulted me upon it; at which time he was only passing this way, and immediately continued his journey.

He, certainly, might have made trial of every kind of remedy, but the surgeon's knife, to no purpose; if the tumour was of that nature of which it was in a young man (q), who had a mass of very white, and solid, flesh, arising from a cause nearly similar, cut out from his scrotum, in the center of which flesh was contain'd a bony body of a globular figure.

But why in these four persons, either one of the testes only swell'd, or continu'd to swell; and not both of them; since the semen must be obstructed in both of the testes equally, by having its efflux prevented in the very middle of the venereal congress, it is not very easy to say; unless we perhaps conjecture, that the quantity of semen, on both sides, was not equal; or that the fluxility of the semen, or the force of the coats, and the cremaster muscle was not the same; or that the absorbent vessels on one side, were more open than on the other; or something else of a similar nature.

41. Tumours, however, of the testes; from whatever cause they have their origin; seem to consist of different matter in different persons; as, for instance (beside the examples hitherto propos'd) of a fleshy and nervous substance, in Borrichius (r); of a glandular substance, and vesicles full of blood, in Bartholin (s); of a "ligamentuous," and in part approaching to the nature of a cartilage, in Schraderus (t); and of a cartilaginous substance in Ruysch (u).

And I myself having, in a man of whom I shall take notice, when on the subject of the gonorrhœa (x), seen the right testicle, in particular, larger than it naturally is; found, upon dissection, a little fat lying betwixt the innermost substance of it, which was in other respects not much diseas'd.

From hence I conjectur'd it might happen, that some tumours of the testes may be, now and then, found to have their origin from fat preternaturally generated, and increas'd. And if I had seen, and been at liberty to dissect, in the dead bodies, those very large tumours that I have sometimes seen in

(o) N. 39.

(p) Eph. n. c. dec. 3. a. & 6. obs. 282.

(q) Hist. de l'Acad. R. des Sc. a. 1700: obs. anat. 4.

(r) Sepulchret. f. hac. 29. obs. 22. §. 1.

(s) Ibid. §. 2.

(t) Obs. supra ad n. 35. cit.

(u) Theat. Anat. 9. n. 51.

(x) Epist. 44. n. 5.

the living body; I do not doubt but I must have observ'd something singular, if the structure had corresponded to the bulk.

For first, I saw at Bologna formerly, one so large as to be almost equal to that which Ruysch (*y*) said was of a "prodigious, magnitude;" or, if he speaks of the same in his *curæ posteriores* (*z*), as he seems to do, "the largest ever seen in the human body." But though it was of a smaller size, I heard, nevertheless, that it was not taken out with so good success, as that larger one.

After this I saw, at Padua, a testis of such a magnitude, that unless you very well knew how far I may be depended upon, I durst not write it to you; fearing least you should suspect me of falsehood. For if that of Ruysch exceeded "the head of a human foetus; this, whereof I am speaking, certainly exceeded the heads of two men join'd into one.

Wherefore, that I might examine so very extraordinary an appearance; in the month of May, in the year 1730, when the man was passing this way, in order to go to Este, where his habitation was; Anthony Mocenici, that illustrious chevalier, and very worthy of his brother Aloysi, at that time Doge of Venice, would have him come to my house.

Where, upon first seeing the man, being ignorant who he was, and why he came to me, I should have suppos'd him to labour under a very great ascites, if I had not observ'd his belly, as it was still cover'd with his garments, to be tumid only on the right side.

But when all the coverings were taken off, and the bandages, by means of which he kept the tumour drawn up to the abdomen as far as the hypochondrium, where it naturally tended of itself, remov'd; being surpriz'd at that bigness which I have mention'd, I began to handle it; for it bore the touch very well, being always without pain; and I seem'd to myself to touch a kind of sarcoma of the form of a spheroid, and every where cover'd over with its skin.

Upon my asking how, and from what cause, it had begun, the patient answer'd, that notwithstanding he had receiv'd the blow when a child, the testicle nevertheless did not begin to grow out into a tumour till he was at man's estate; but that it had at length grown out into this bulk in the space of a few years.

42. But it is necessary, here, to put you in mind of one thing; I mean that Valsalva, as it stands in his papers, had seen the increas'd magnitude of the testes to be, for the most part, owing to the disorder of the coats that invest them.

Nor is it difficult for me to believe this, especially in some particular cases; since, as I have said in the preceding letter (*a*), having found the testicles to be bigger than they naturally are, and considerably tumid, I perceiv'd this not to arise from a distention of their substance, but from the coats being much thicken'd: and, indeed, in herniæ, both true and spurious, I have observ'd the thickness of the membranes, wherein they were contain'd, to be much increas'd.

So in the hydrocele, which I describ'd above in the soldier (*b*), I remark'd that the tunica erythroides, and vaginalis, were thicken'd; as I did elsewhere

(*y*) N. 51. cit. & tab. ibid. 3. fig. 1.
(*z*) N. 28.

(*a*) N. 28.
(*b*) N. 17.

in a butcher (*c*), who was affected with herniæ of the same kind, that both the vaginal coats were very dense. Thus in the epiplocele of an old man (*d*), I found the peritonæum, which compos'd the sacculus, to be dilated, and at the same time become much thicker; and in the entero-epiplocele (*e*) of a young man, the coat of the sacculus was not less thick, and firm, than that of the pulmonary artery; and in the crural hernia of a woman (*f*) it was so thick, that it could be divided into many different laminæ, as it were, without any great difficulty.

Yet it may happen, where the orifice of the sacculus is much more large than the ring, as is the case in very great herniæ; or where herniæ happen in those places, in which the tendons of the muscles are, in their natural state, quite unperforated; as is the case betwixt the recti and the obliqui, or above and below the navel, betwixt rectum and rectum; it may, I say, happen, that the thickness of the sacculus is not only from the peritonæum, but, in general, from the tendons also, which are driven outwards together with the peritonæum.

Mery (*g*), therefore, in that hernia which was made up of almost all the small intestines, saw not only the peritonæum produce itself into the sac, but also the several tendons of both the oblique, and of both the transverse muscles, and that very evidently: and how far Waltherus saw these three tendons also extending themselves in a hernia, and sustaining a great weight of the intestines; though not to be compar'd with that of Mery; and resisting, as far as possible, the farther growth of the hernia (which use he likewise thinks they perform in other herniæ, and that not unfrequently) you will learn from the *Acta Eruditorum* that are publish'd at Leipzig (*h*).

But, although Mauchartus (*i*) not only delineates a lamina, arising from the tendinous fibres of the external oblique muscle (*k*), but also proposes it among the other coats of the hernia, by the name of *tunica aponeurotica*; yet you may easily call to mind, how far I have said these are allow'd of by me.

Nor does it escape me, that there are very excellent anatomists who deny that these appearances could be seen in herniæ dissected by them.

And as I very readily give credit to them, so I should not be ready to suppose that Mery, and Waltherus, those excellent dissecters in other herniæ; for they did not speak of all; could not, as they made use of so much diligence in that inquiry, have seen what they say they had seen.

However; to lay aside this controversy in the mean time; there are sufficient examples which relate to those coats, that are universally acknowledg'd in herniæ, to make it appear, how the testicle; which has not of itself become so tumid; may seem to have attain'd to a very considerable bulk, chiefly from the thickness of these coats being increas'd.

There is a second observation of the same Waltherus, propos'd in the same acts (*l*), in which the scrotum, and the penis, are describ'd to be so tumid,

(*c*) Epist. 21. n. 19.

(*d*) Ibid. n. 15.

(*e*) Epist. 34. n. 9.

(*f*) Ibid. n. 15.

(*g*) Mem. de l'Acad. R. des Sc. a. 1701. obs.

(*h*) A. 1738. M. Jun. p. 2.

(*i*) Differt. & cat. supra ad n. 3. cit.

(*k*) Fig. 2. ad DD.

(*l*) A. 1725. M. Novembr. cum tab. 5. fig. 1.

that the latter extended itself to the knees, and the former below them; the thickness of each of these parts corresponding to this length.

And I do not remember any observation to have been more similar hereto, than that which was sent to me, in print, in the year 1755, from Syracuse, and confirm'd by the public testimony of the city. But this was from a living man; and that of Waltherus was made even on the dead body.

In this last therefore, upon examination, the skin of the scrotum was found to be three times as thick as is natural; and the cells that lay beneath, and went betwixt the testicles, were so distended with a tenacious humour, as to resemble a heap of inert flesh; to which the weight of the whole tumour, that is to say, of almost fifty pounds, seem'd to be principally owing.

The testicles indeed, were much larger than their natural size; as the thicken'd albuginea contain'd a fluid, and tephaceous concretions, so that but a very small part, and that in one side only, was left free for the slender tubuli, which compose the substance of the testis, to occupy.

But how very little a part of the general tumour, then, was form'd by these tubuli, you very well conceive. That very excellent man Heister (*m*) has therefore suppos'd, with great sagacity, as he generally does, that this was a tumour rather of the scrotum than of the testicle: nor did he judge differently of some others, the dissection whereof we have not; among which is that of sixty pounds weight, spoken of in the history of the Royal Academy of Sciences at Paris (*n*).

For this very experienc'd man (*o*) knew, that, even in a hydrocele, and especially one of long standing, the coats of the testicles, and particularly "the dartos, and vaginalis, were often very much thicken'd;" so that he had seen them equal to the thickness "of five or six lines, and more:" for which reason he has admonish'd us, that it was, for the most part, very difficult to perforate them," with the point of a triangular instrument; and that on this account (*p*), the point of such an instrument "ought not to be "too hastily withdrawn, because otherwise the coats would not be pierc'd "through."

And indeed, how much the tunica albuginea may be thicken'd in a sarcocele, he has, doubtless, left us to conjecture; when, after cutting into that coat, with the expectation of seeing the seminal vessels large, and very much distended, he found them "equally small as they generally are in a sound "and natural testicle, which," says he, "is greatly to be wonder'd at, in "so considerable a distention of the testicle."

And that you may have another example of this coat being thicken'd, examine that figure of a human testicle become bony, which is given us by the celebrated Reinholdus Wagnerus (*q*). When you have seen how much larger this was than the natural testicle, then observe that the "surface" of it only, "of the thickness of a pigeon's quill, had been chang'd into a very hard "bone;" that externally it was rough with bony tubercles, of the bigness of a pea; but internally smooth; where it comprehended a small cavity, in which "the gelatinous matter of the corrupted semen lay hid."

(*m*) Dissert. de Sarcocele, §. 36.

(*n*) A. 1711. obs. anat. 1.

(*o*) Dissert. de Hydrocele n. 32.

(*p*) N. 36.

(*q*) Eph. n. c. cent. 1. obs. 30.

That is to say, the substance of the testis, formerly included, was now annihilated; and the bony surface was owing to the tunica albuginea being made thick.

43. However, although this letter is really shorter than the former, as I promis'd you, I omit to add other things at present, on the subject of herniæ and testicles: and shall not even subjoin any thing in regard to the pain of these parts, unless that you may read the observations, which I pointed out above (*r*), from celebrated authors; and that, in those wherein you will find there was pain; and you will find this in many; you will attend to the state in which the testicle was.

At the same time, you will readily learn from one of them, which is Heister (*s*), in what manner, not only in that patient, but in another also, whom Sproegelius describes (*t*), pains may be propagated from the testicle to the loins. Nor do I add any thing farther, though the next section, of the Sepulchretum, is entitled *de Testiculorum Doloze*.

For the whole of it, when taken together with the Scholia, scarcely fills up two pages: and therein; to say nothing of the fourth observation, which perhaps may be an abstract of the first; at least the fifth, as Bonetus himself confesses, is taken from the second article of the twenty-second observation, of the preceding section: and of the Scholia, which he does not confess, one part, subjoin'd to that first observation, had already been adopted by him; even where it is most openly contradictory to the circulation of the blood; and applied to article the third, under observation the twenty-first of the same preceding section; as he also here subjoins to observation the second, a part of the Scholium which he had there subjoin'd to the twentieth observation.

But there also, it is not so much to be wonder'd at, that what had been already plac'd under the second article of the fifteenth observation, should be again repeated in observation the twenty-third, as that, in one and the same page, what had been just said in the second part of the Scholium, to article the first of the twenty-second observation, should be repeated in the first part of the Scholium to the second observation.

Nor would I have you say that many things have, likewise, been repeated, by me, in this letter, which I had already given in others, when relating my observations, or those of Valsalva. For it is one thing to repeat what has been already sufficiently said; and another thing lightly to touch upon, in a brief manner, what has been already deliver'd in other places; in order to prevent observations from being torn piece-meal, and to make them complete; that the circumstances may be consider'd in a more convenient place, as had often been promis'd there.

This method, as I hope you will approve of it, I shall preserve; and the former, which I have no doubt but you will equally disapprove, I shall, without hesitation, reject. Farewell.

(*r*) N. 38.

(*s*) Differt. ibi cit. §. 30.

(*t*) Obs. ibid. cit. §. 51.

LETTER the FORTY-FOURTH.

Treats of the Gonorrhœa.

ALTHOUGH there are, perhaps, few anatomists by whom so many male urethræ have been dissected, and accurately examin'd, as by me; yet it is either much more seldom than is commonly suppos'd, that very evident marks appear, in that canal, of diseases having accompanied the contagious gonorrhœa; or it has happen'd, by I know not what fatality, that notwithstanding so great a number of men is infected with this gonorrhœa, I never, or scarcely ever, saw those evident marks of disease.

What happen'd to Valsalva in this respect I do not know; for he did not commit his remarks to writing, if he did chance to find any thing of this kind, in those who had died while they labour'd under this disorder. What has happen'd to others I have read.

But what I have seen myself, or not seen, I will now write to you, in such order, that, beginning from the external orifice of the urethra, I shall go on to the internal orifice which is at the bladder.

2. When, in the *Adversaria* (a), I gave my reasons why the first seat of the virulent gonorrhœa seem'd, to me, to consist chiefly in those larger canaliculi of the urethra, which I had discover'd, I did not omit this among others, that from these small canals, for the most part, when irritated by the acquisition of any malignant habit, that humour, which generally distils from the urethra, in the first stage of this disease, might proceed.

For this humour is not true semen, as a comparison of it therewith, has sometimes taught even those very persons, who, led aside by a false opinion, often made use of venery, in order to get rid of the disease: and as I have been thus inform'd, even by the persons themselves, so I have often been assur'd by others, that in this first stage of the disease, there is not, as yet, any troublesome sensation in the perinæum, which shows the disorder to have descended any deeper.

Nor again, is that which is discharg'd true pus: as the pain is not yet of that kind which argues an erosion; nor has any even the slightest tincture, nor the least drop, of blood ever yet appear'd.

To these things I think it would be now proper, to add the observations of that very great man Senac (b), according to which the globules of matter,

(a) IV. Animad. 9.

(b) *Traité du Cœur Supplém. c. 8. n. 5.*

that is discharg'd in a gonorrhœa, are very large; but the globules which compose the pus of ulcers, are very small and unequal; if they are look'd at with both the eyes, when furnish'd with the most exquisite glasses, and are compar'd with the globules of the blood.

Following Rondelet therefore in particular; who cautiously and prudently, as you have it in the Sepulchretum (*c*), has said that this matter "bore a resemblance to pus," or "was similar to pus;" I have also call'd it "puriform."

This situation of the gonorrhœa in the canaliculi pleas'd several authors, I do not say Cockburn (*d*); for this author, though in other respects a learned man, was even immoderately pleas'd with it; but I say the great Boerhaave (*e*), and the illustrious Haller (*f*), who acknowledge "the seat of the first species of the gonorrhœa" to be in these parts; and that, by irritation being at length chang'd into erosion of the corpus spongiosum urethræ, which is divided from these canaliculi only by a membrane, blood itself frequently flows out.

It has also pleas'd other very learned men, who mark out these small canals by the name of *cellule multiplices*: with which, however, I do not very well understand, how they also comprehend the gland of Littre; or how they can ascribe to him, who never mention'd any thing of canaliculi, the observation of these being affected in a gonorrhœa; as if this were read in the Memoirs of the Royal Academy of Sciences at Paris, for the year 1711.

But, in regard to the canaliculi of the urethra in women, which were describ'd by me (*g*), in the same manner as those in the urethra of men; and in regard to the sebaceous glands, which I, in like manner, found in the nymphæ, and the neighbouring labia (*b*); the last of which go under the very name of glands, and the former under the appellation of cells; I will not speak of them here for this reason; that as I have never happen'd to light on women, who labour'd under a kind of external gonorrhœa, or were troubled with an internal, when they died; I cannot determine whether this latter has its situation sometimes in these canals, or the former in those glands.

Nor have I been more happy in men; so as to meet with those who were infected with the same external gonorrhœa, which the physicians of Montpellier are said to have formerly call'd "spurious;" that I might inquire whether the matter of this external gonorrhœa came from the surface of the glans, without being affected with any ulcer, or from the glands of the corona of this glans; that the opinion of Littre might be confirm'd, who takes those granules of the corona for glands, and not for papillæ, as Ruyfch did (*i*).

I say the opinion of Littre; nor was it ever mine: for when I took notice of that, I withheld my assent from both, in order to make a more strict inquiry; so that I cannot help wondering there should be any one, who, after having read my first (*k*) and fourth Adversaria (*l*), should ascribe the former opi-

(*c*) Sect. hac 31. l. 3. in Schol. ad obs. 1.

(*b*) Advers. l. n. 11. & 12.

(*d*) The Symptoms, &c. of a Gonorrhœa,

(*i*) Hist. de l'Acad. R. des Sc. a. 1722. obs.

ch. 4.

anat. 4.

(*e*) Prælect. ad Instit. §. 654.

(*k*) N. 11.

(*f*) Not. i ad eum locum, & nota d §. 657.

(*l*) Animad 14. in fin.

(*g*) Advers. 4. animad. 24.

nion to me; and even should assert, that a “celebrated controversy had” arisen, betwixt Ruysch and Morgagni,” upon this subject.

For though it is true indeed, that this fell from Ruysch (*m*), that these granules “had been describ’d, and delineated, as glands,” by me; yet as I hop’d that every one would easily perceive, from my Adversaria, that this excellent old man had been so much taken up with other things, as not sufficiently to comprehend my opinion, I thought it quite superfluous to answer him, even by a line. And this is the whole of that “celebrated controversy.”

Much more rare than these external gonorrhœas, is that which the celebrated Wolff (*n*) saw and cur’d. For a humour distill’d from the urethra that was “analogous to semen;” being at first white, and after that green; with very great pains in making water, and an incurvation of the penis; and yet was not the consequence of impure venery, nor of any venery at all; but this gonorrhœa proceeded from other causes that he enumerates: and this is not only asserted by him, but is shown by the cure itself, as Hippocrates (*o*) says: that is to say, by the cure being brought on easily, and speedily, by the administration of such remedies, as were opposite to these causes.

But to pass over this gonorrhœa, and that which is called *sicca* or dry; or as it ought properly to be call’d, according to the monitum of the celebrated Astruc (*p*), the dry venereal dysuria; I must contract my discourse, and come to that which is the most frequent, whereof I had begun to treat.

Wherefore, what I had in my power to see by dissections, you will learn from the observations that I shall immediately subjoin; beginning with a pretty long history, but such a one as will be the more pleasing to you, because, when I made some slight mention of the angina, on a former occasion (*q*), I greatly complain’d, that, in a very violent disorder of this kind, dissections of such persons who died of it, were still wanting.

Therefore, that which was, even then wanting with me, you will here have in the first place; and last of all, those things that relate to the subject of this letter will not be omitted from the same history.

3. A carpenter, about three and thirty years of age, tall, large in body, and of a pretty fat habit; having been, as far as could be learn’d, in good health before; being immoderately heated by wine, and by the fire, went home in the night, in a very cold season.

Being there seiz’d with a violent fever, and an angina, a physician was sent for, on the very same night, and blood was taken from his arm. As the disease did not at all remit, he was brought into the hospital in the morning: where the same remedy was repeated, but with so little effect, that in the afternoon blood was taken from his foot.

On the next day, when the other remedies; which had been before given, internally, to be swallow’d slowly as well as he could; and those which were then made use of, both internally and externally, had been equally of no effect; blood was again taken from his arm in the morning, and at noon from

(*m*) Thes. anat. 10. n. 98.

(*o*) Sect. 2. aph. 17.

(*n*) Commerc. Litter, a. 1742. hebdom. 47.
n. 2.

(*p*) De Morb. Vener. 1. 3. c. 3.

(*q*) Epist. 14. n. 39.

the veins under the tongue: for the jugular could not be open'd, though the physicians wish'd to have it done, the patient not being able to bear the situation requir'd.

After all these remedies, the fever and anxiety were not only not decreas'd, but even greatly increas'd; and with these the difficulty of swallowing, speaking, and breathing, at the same time; when, on the third day of the disease, the patient saying that he had labour'd under a virulent gonorrhœa, for fifteen, or, at least, not many more days, the vein of his foot was again open'd.

The blood which had been taken away so many times never had any crust on the top; but was always somewhat hard, and had very little serum. His neck was tumid in some measure; but not his face, which was not even red.

About two hours after the last venæsection in the foot, although the pulse still remain'd strong, yet the patient himself perceiv'd death to be at hand. And this did really attack him on the same third day, about noon; yet in such a manner, that it might seem to have come on accidentally.

For having ask'd for the gargle which he made use of, and, perhaps, incautiously taken more, into his fauces, than he intended, he immediately died, in such a manner, that they who stood by him, thought him suffocated from thence.

As the day was at hand, on which I was to begin teaching anatomy in the theatre; that is, the nineteenth of January, in the year 1748; the body, though kept two or three days, was, nevertheless, exceedingly proper for demonstrations; as the season of the year was so extremely cold, that I could even make use of some parts of it on the twenty-sixth day after death.

The whole, therefore, being dissected accurately, and in order, offer'd some things to our observation, which do not belong to this place; and these in particular which I shall give you here, beginning from the parts last dissected, and going on to the first.

The vessels of the cerebrum, both external and internal, and not only within the ventricles, but also here and there, through the medullary substance, were distended with blood; but still more they that creep through the left side of the pia mater. This membrane, like all the other membranes of this body, whether you endeavour'd to cut into it, or cut it asunder, gave more resistance than usual. In the lateral ventricles was a small quantity of somewhat-bloody water.

The tongue seem'd to be thicker than is natural: and, at least, show'd the vessels that go upon its upper surface, from the basis towards the apex, to be somewhat thicken'd from the stagnating blood, not to say manifest. The uvula and the palatum mobile were found.

The tonsils, however, not only had the membrane, with which they are cover'd, become very thick, from a stagnation of yellow serum therein; so as to resemble a kind of yellowish jelly; but they also were swell'd, and the left still more than the right, as it was very hard, and, if you press'd, or cut it, discharg'd pus.

As to the neighbouring larynx, not only the cartilages thereof, but also the proper muscles, each of which I examin'd separately, were without any disease or inflammation. But there was a disorder in the membrane, with

which the larynx is invested, both internally and externally : internally the disorder was slight, but externally very considerable.

For internally it was somewhat redder than usual ; as in the neighbouring part of the aspera arteria also ; and somewhat swell'd, but slightly ; so that the chinck of the glottis did not seem to be made narrower thereby. But where the same membrane clos'd the epiglottis, both on its hollow, and convex, surface, and even on its sides also, it was tumid ; being in some places of a bright red colour, and in other places of a bright red degenerating into brown ; yet less on the hollow surface, than elsewhere ; nor on the whole of that, but only on the upper third part of it.

By cutting into this part, it was plain that this tumour, and colour, were owing to blood and serum which distended nothing but the membrane, and the glandular bodies that were join'd to it ; a part of which fluids already began to be converted into pus on the convex surface. Moreover, where the same membrane covers the larynx, externally, on the back-part, that membrane, and the glandular bodies, which it envelopes, were affected with a very considerable inflammation, especially on the sides.

For on each side it rais'd itself up into a protuberance, nearly of the thickness of a man's little finger. These protuberances, proceeding from the region of the basis of the cartilago cricoides, at its lower parts, and converging, as they ascended, came so far, as somewhat to exceed the height of the arytenoid cartilages ; being however entirely unconnected with these cartilages, and that upper part of the larynx, though they adher'd to the remaining and inferior part.

You would have said that they were two inflam'd condylomata, considering their shape and colour, which was the same with that I have describ'd in the glottis ; except that, in these protuberances, it was more of the bright red, and less of the brown.

But in dissecting them, I saw that they consisted of the membrane, with its glandular bodies, tumid from stagnating blood and serum ; and that most on the left side : which side was most affected, as I have said was the case in the tonsils also, and the pia mater. Thus you have the best account I can give you, of the seat, and nature, of this angina.

In the thorax the lungs were neither turgid nor inflam'd ; but quite sound : although, as I said of the other membranes, those of which these viscera are constructed, resisted more than usual, when cut into, or drawn asunder ; and the left lobe had been very closely connected with the pleura : whereas the right was quite free and unconnected.

In the pericardium was a little redish water ; which, certainly, had not been thus ting'd by blood being mix'd with it in the dissection : for this water was concentered, by the force of cold, into lamellæ, which were internally red.

In the heart, which was preternaturally enlarg'd, or at least seem'd to be very large, in proportion to the body ; which was itself large ; nothing polypous was seen : nor was any appearance of this kind found elsewhere, but a small quantity of black blood, and this neither too fluid, nor concentered.

The large artery had many marks of disease, from the valves that are prefix'd to it, which like the other parts of the heart were found almost quite to the cæliac artery ; and those very evident. For it was white here and

there,

there, internally, with certain spots, though not very frequent, nor yet verging to a bony hardness.

Internally also, if you except the places of the spots, its surface was scarcely any where white, but of a red colour inclining to brown; and not shining, and smooth, as it generally, and naturally is, but unequal with certain small, and low excrescences, of the colour that I have already said, both internally and externally; but of a different form and magnitude; yet so that you might cover the largest of them with a lupin, the figure of which they nearly resembled.

When you look'd on them, you would suppose them to be soft; but when you cut into them, you would find them to be no less hard than the parietes of the artery. This disorder was so much the greater in proportion, the less the artery receded from the heart; yet did not extend itself into the carotids, and subclavians, nor below the cæliac: below which, even that first-mention'd disease of the white spots became much less and less.

Besides these appearances, all the parietes of the artery were harder than they naturally are. Finally, the fourth sinus of Valsalva was clearly, though not in any great degree, larger than is natural.

And this I also observ'd in the septum of the venous sinusses of the heart; or, if you please, in the septum of the auricles of the heart: on the surface, which is turn'd towards the pulmonary vein, and comes forwards, it was hollow'd out with parallel furrows, which were not very small.

In the belly; the viscera of which had grown hard from the frost, the bile itself having, in some measure, freez'd within its vesicle, and the blood itself within the spleen; I found nothing that was contrary to the common appearances of nature, if you except a globule in the mesentery, near to its edge, that resembl'd nothing more in its form, colour, and magnitude, than a pretty large boil'd egg: I mean one of those which are protuberant in the ovarium of a hen.

This was nothing but fat, yet of a more yellow colour than the rest, and comprehended within one membrane only, form'd into the shape of a spherical bladder; without any membranous lamellæ, that could be observ'd to run in betwixt.

By reason of the patient's spontaneous confession, in relation to the gonorrhœa, I examin'd the whole of the urethra very accurately. The prostate gland might have seem'd to be larger than it ought to be, if it had not been join'd, as in a large body, with a large penis also.

This gland was found, the caruncle was found, the vesiculæ seminales, the semen, and the orifices, through which this fluid is express'd from the vesicles, were in a natural state. And even our canaliculi shew'd no peculiar appearances; except that the internal surface of the urethra seem'd to be somewhat moister, and more red, than usual.

One of Cowper's glands was wanting, which is a circumstance not very rare; and the substance of the other was chang'd into a hard and firm body, so as to resemble a ligament.

4. Not to digress, then, too far from the subject of this letter; I omit those circumstances relative to the angina, and the peculiar appearances observ'd in the aorta: I say I omit the consideration of these and other circumstances;

stances; and attend only to those which have a reference to the gonorrhœa.

If you set aside the consideration of Cowper's gland being become hard, which is a circumstance, that, if it relates to the gonorrhœa at all, certainly does not relate to a recent one, and therefore, of course, not to a present gonorrhœa; you plainly see that nothing can be refer'd to this, besides the increas'd secretion of humour in the canals: from whence the surface of the urethra was very moist, and, from the strongly irritating nature of the same humour, redder than natural. To this subject may be refer'd what I saw in another man, when prosecuting a different inquiry.

5. About the end of March, in the year 1741, I dissected, carefully, in the hospital, the body of a man, who, having been carried off by an inflammation of the thorax, was a very proper subject for muscular demonstrations, and the examination of other parts of that kind.

I made it my business, then, to inquire into natural, and not preternatural appearances; when, being about to inspect the testicles, in one of which I found what has been taken notice of in the preceding letter (*r*), I happen'd to observe, that, by compressing the glans penis, a little matter came forth from the orifice of the urethra.

I immediately open'd this canal, in that part which hung on the outside of the body, together with the penis; suspecting that the man had labour'd under a gonorrhœa. Yet except a dilute red colour with which the internal surface of that canal was ting'd, and a kind of moisture, greater than natural, I could not see any thing that related to this suspicion.

As I defer'd the dissection of the remaining part of the urethra to another day, I was so taken up with other observations, as frequently happens, that I forgot to prosecute the present, in order to render it compleat.

6. Yet here there had been nothing more than a suspicion. Attend now then to what I found when there certainly was a gonorrhœa, though not a recent one.

7. A young man, of five and twenty years of age, whose face was of a yellow colour, had renew'd a virulent gonorrhœa of a long standing, by a more recent one, within six months. And while this continued, he lost so much blood, and so frequently, from a deep wound inflicted on the left side of the neck, that he fell an inevitable sacrifice to death, in the beginning of the year 1740.

The body being almost bloodless, by reason of the foregoing hæmorrhages; and, on that account, very fit for anatomical inquiries; it was dissected in the same place as the former, in the presence of many auditors, with so much the more accuracy, as it had but very few things differing from the natural structure: and these I will give you the relation of, before I speak of the urethra.

In the lateral ventricles of the brain, together with the plexus choroides, which, for the reason I said before, were pallid, was a little not very limpid water. The wound of the neck reach'd, in its utmost bounds, to some considerable branches of blood-vessels, not far from the middle vertebræ of the neck.

The belly contain'd an indurated liver; the lobules being very evidently conspicuous; and a large spleen.

When we came to the genitals; on inspecting the preputium, the glans, and the whole of the urethra, very attentively, I found no mark of ulcer, erosion, or redness in any part; nor any thing else that related to the present gonorrhœa, if you except a greater moisture than usual, reaching from the middle of the urethra, quite to the glans.

But to that old, and long-continu'd gonorrhœa, I suppos'd these things to relate; first, that, almost from the place where the moisture began, an oblong whitish line was prominent, tending, obliquely, towards the farther parts of the urethra: which line I have already taken notice of in the forty-second letter (s), and consider'd as the remains of an excrescence of flesh, that had been formerly luxuriant: in the second place, although I observ'd nothing preternatural in the colour, and substance, of the prostrate gland, and the caruncle itself; yet of the orifices, whereby the semen is thrown out into the urethra, the left was destroy'd, or at least choak'd up and become blind; and the right so narrow, that I could scarcely see it, and with difficulty introduc'd a bristle: I also found the vesiculæ feminales so contracted and shrivel'd, that you might suppose them to contain nothing; and this did, in fact, appear to every-body, whereas, by even pressing them very frequently, nothing was discharg'd through that right orifice of which I spoke just now; yet in the testicles was found no disorder that was obvious to the senses: finally, to omit that there was scarcely any trace of Cowper's glands; for they may, as I have already said (t), be wanting from the original formation; none of my small canals, except one that was narrow and short, did at all appear; so that I was under a necessity of accounting for this moisture (which I have been wont to deduce from these chiefly, but not wholly) principally from those very small ones, which were known before I discover'd mine: neither of which, however, "were formerly well known to Eustachius," although an excellent, and humane young man affirms it, and says that the "tables of this author show it:" but I take for granted that you will believe the contrary for a long time, if you continue to give credit to me, till the numbers of those tables, which show it, are pointed out.

8. You will perhaps be surpriz'd, that, in the observations in question, wherein a gonorrhœa was present, no other mark had occur'd to me, that could be refer'd to the present disorder, but a moisture of the urethra, sometimes join'd with a redness; since, to omit the observation of Terraneus (u) of a urethra "being entirely livid from inflammation, and of the disgregated glands" therein, which with us are the very small canals, "being immoderately swell'd;" even in this first part of the urethra, whereof we speak, Vesalius (x) has asserted that the fossula, or lacuna, which is within the glans, "is very much infested with ulcers" in this disease; which is confirm'd by others also, and particularly by the celebrated Astruc (y), who says, that in this fossula "it is found, that very considerable ulcerations, for the most part, "are latent."

(s) N. 41.

(t) Aderf. anat. 4. animad. 15.

(u) De Glandul. post. c. 5. obs. 5.

(x) De Corp. Hum. Fabr. f. 5. c. 14.

(y) De Morb. Vener. l. 3. c. 1. §. 2.

For this very thing was one of those appearances, which I wonder'd had never occur'd to me; particularly, as I had so many times heard the complaints, in patients of this kind, of a very severe pain affecting them, in that part, "to a remarkable degree, while they discharge their urine," to use the words of Vesalius; since Terraneus (z) does not, as others, and among these Astruc (a), make mention of a sharp, and burning pain, "at the time of making water," but even says, "that it is, for the most part, scarcely perceived" at this time: yet that, "when the patient has finish'd to discharge his urine, there is a violent burning through all the tract of the urethra, and particularly where it terminates in the glans."

Which pain, that follows making water, I do not for this reason diminish; but I say that I have heard the greatest complaints of that pain which accompanies the discharge, so as to have lit on some persons, who affirm'd that they would not discharge their urine; unless I could, by some opportune remedy, alleviate the torture, wherewith they were, at that time, affected.

And I satisfied the desires of these persons, not only by diminishing the acrimony of the urine, as far as possible, but, particularly, by a method not far unlike that of Arantius (b); who taught those that were affected with a violent pain, and soreness, from the hæmorrhoids, how to discharge their excrements with less torture of the intestines, by sitting upon a clostestool full of a hot, oily, and watry fluid; by the fomentation of which, the anus, not only when shut, would be soften'd and relax'd, but soon after, also, when open'd to emit the contents of the intestines.

That is to say, I have taught them to let the penis down into a glass chamber-pot, half-full of warm milk; and, after having, by degrees, mitigated the pain in some measure, by that fomentation, to let their urine come from them gradually, and without impetus; still keeping the penis immers'd in the milk.

There have been some, who, when instead of milk (the use of which in this manner I afterwards saw was taken notice of even by Riolanus (c), as also the introduction of a short leaden or silver pipe, which our Fabricius (d) had invented); there have been some, I say, who, when instead of milk, oil recently express'd from linseed was at hand, have chosen to make use of this.

And on both sides it is affirm'd, that great advantage has been receiv'd from these applications: these last having added this circumstance also, that when the preputium was tumid and painful, the pain, and tumour, of that part had been dissipated in the course of one single day, by keeping it in this kind of fomentation.

But this by the way; which you may render still more useful, by distinguishing cases, and boiling ingredients in the milk, suitable to the particular case. Let us return then to our subject.

Although Vesalius, and others, have said what is true; yet not all gonorrhœas, nor at all times, have the same acrimony. It has indeed happen'd, which is a very surprizing thing, that none have ever been met with by me,

(z) Loc. cit.

(a) C. cit. §. 3.

(b) De Tumor. p. n. c. 6c.

(c) Anthropol. l. 2. c. 30.

(d) De Chirurg. oper. ubi de Penis Chir.

in dissection, but slight ones; or that I have met with them only at their milder stage. Yet I have often lit on such traces, as sufficiently shew'd what injuries I should have found, even in this first part of the urethra; if I had dissected these canals when they were most affected thereby.

9. For you read just now (*e*), that in the young man who had been affected with an inveterate gonorrhœa, no more than one of my canaliculi was left, and that this was narrow and short. No more than one, likewise, appear'd in a certain porter; whose case (as he fell from a great height, and died in consequence of this fall) I shall describe to you when I come to treat of wounds and blows (*f*): and in his urethra, where it corresponded to one side of the corona glandis, remain'd some mark of an old injury.

And you have seen, from the forty-second letter (*g*), that no more than one canal was remaining in an old man, who was a foreigner; whereas the cicatriz'd state of the glans, and the contracted state of the urethra, plainly shew'd what disorder had formerly preceded: and you even know from the same place (*h*), that in a young man, in whom those same tokens were not wanting, not so much as one of them remain'd; to say nothing of a man, whom I shall describe hereafter (*i*).

And nothing is more probable, than that, in consequence of inflammation, and exulceration, which had, at length, arisen in the small canals, the thin membranous parietes thereof had adher'd to each other; and that the cavity had, by this means, been intercepted and lost: for that there had been ulcerations, in that very part of the urethra, the coarctation of this part, and even the excrescence, of luxuriant flesh, in the very seat of the canaliculi, jointly demonstrated.

But if these disorders have been violent; provided they have not been extremely violent, or not common to all the canals; either all or some of them may remain.

Thus in a certain man, whom I dissected in the hospital, about the end of November, in the year 1718, having found marks in the beginning of the urinary passage, of a foregoing lues; I saw that some canals, though but few, still remain'd; just as you have read, that, in the butcher (who, as I have related to you in the eighth letter (*k*), had small ulcers in the preputium, and cicatrices in the urethra) they were but very few in number: nor have I mention'd more than one or two in a gentleman, who had been, more than once, affected with a lues venerea, as spoken of in the twenty-eighth letter (*l*).

But I remember, that they were all still remaining, in the stable-keeper (*m*), whose urethra I, nevertheless, found unequal with two whitish lines, at about the distance of three fingers breadths from the outermost orifice; which, I take for granted, were the traces of cicatrices and excrescences.

Yet when they are very attentively examin'd, by any one who is well vers'd in the structure, and appearance, of these parts, when in their natural state; I know not what is then sometimes perceiv'd, from whence it

(*e*) Supra, n. 7.

(*f*) Epist. 53. n. 37.

(*g*) N. 40.

(*h*) N. 39.

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(*i*) Epist. 50. n. 30.

(*k*) N. 28.

(*l*) N. 6.

(*m*) Epist. 4. n. 19.

may be suppos'd that they had been, in some way or other, affected; as I know that it happen'd to me, in the body which I shall speak of just now.

And as, in those persons, in whom all these larger canals are obliterated, it is certain that so much of the lubricating humour, which serves to defend the urethra against the acrimony of the urine, as they have been the instruments of its secretion, must be wanting; so it is agreeable to reason, that they must be, afterwards, more liable than others to a sense of ardor, from the stimulus of the urine, when in a more acrid state than usual; and even to erosion, unless the whole urethra has grown callous: and that the others, in proportion to the number of the canals that have been lost, or in proportion to the injury brought upon these canals, are attack'd with uneasinesses of the same kind, though somewhat slighter indeed. But let it be sufficient to have hinted at this. And let us go on to what I just now spoke of.

10. Certain parts of an asthmatic man, who had died in the hospital, were brought into the college, when I was teaching anatomy from the body of another man, in the year 1746. For I like to show the same parts, from more than one body, when it is in my power; and to show them differently dissected from each other: and this I was then inclin'd to do in the vesiculæ feminales, and the penis.

These vesicles, although their cells were internally moist, nevertheless contain'd no semen. The caruncle, and whatever related to the upper part of the urethra, was in a proper state.

But when we were about to cut through the lower part, and had introduc'd a pretty thick probe, through the lower orifice, and open'd the part of that canal, which is surrounded by the glans; the surface of which part was somewhat unequal; on attempting to push the probe higher up, we found that it would not pass for more than an inch and a half.

Then having attempted the same thing, at the upper part which was open, we found the same obstacle, when we came to that part which I have refer'd to. Opening it therefore, by degrees, on that surface (according to my custom) which is opposite to my canaliculi, I at length observ'd these things.

There was a tract of three inches breadth, or more, from which it is was easy to see that the urethra had formerly been ulcerated. For on that surface, in which these canals are, were observ'd three or four whitish, and almost tendinous, little chords, that pass transversely, or rather bands, not very prominent, nor ever separating themselves from the internal membrane of the urethra.

Betwixt chord and chord, there was an interstice; and then, almost in the middle space betwixt the first and last, the urethra contracted itself for about as great a length, as two fingers breadth would have taken up; so that, in this part, it was narrower, by almost one half, than it was either above or below.

Though all these things fell within the region of those small canals, whereof I am speaking, yet they themselves, and their orifices, seem'd, at first sight, not to be in a preternatural state.

But when I fix'd my eyes very attentively thereon, and consider'd them accurately, I was very certain that they did differ from their natural appearance

pearance, in a certain manner, which I can better conceive of, than explain in words; so that it was clear they had formerly suffer'd some injury, though less than that with which the neighbouring part of the urethra had been affected.

And this the situation of the chords, that is of the cicatrices, in that surface of the urethra only; I mean betwixt the orifices of the canaliculi; seem'd to confirm: as it shew'd from whence the irritating, and at length ulcerating, virus had distill'd.

11. But now let us pass on to the farther part of the urethra, as I have promis'd. We also meet with the seat of a gonorrhœa here, the second with us, the first with Littre; that is to say, as he himself has determin'd, Cowper's glands: for so I shall continue to call them, since Mery, for I know not what reason, seems to have given up his claim, as he silently suffers they should have been so call'd more than once by Littre, and shown in the Royal Academy of Sciences (*n*) under that name; and moreover, that in the history of this Academy (*o*), the first discovery of them should have been expressly ascrib'd to Cowper.

But how seldom these glands are the seat of the gonorrhœa, appears very clearly from hence, that Littre (*p*) having dissected about forty bodies of persons who had been affected with a gonorrhœa, found only one in which any disorders of these glands appear'd: and these he describes accurately, and separately, with all the circumstances which relate to this species of gonorrhœa; not even being silent as to the cause why it is so rare.

I am less surpriz'd, therefore, that I have not lit on the body of a man affected in this manner.

Yet I suppose that I have seen marks of this disease having formerly preceded; either when I have found both these glands, or one of them (as in a carpenter of whom I have spoken above (*q*)) chang'd into a hard substance; for, after inflammation, glands frequently grow hard; or when I have met with traces in their ducts, not of inflammation only, but also of ulceration; as in that case of which I shall immediately speak.

12. A young man having died in the hospital, about the middle of April, in the year 1718, in consequence of a blow on his head; I dissected the parts of generation, on the anatomy of which I was then very frequently employ'd, with accuracy. And I found the other parts, of which I am not about to speak, in a regular and natural state.

That the urethra was not in its natural state, I immediately apprehended, when, upon uncovering the glans, I observ'd a hollow cicatrix thereon. Yet the prostate gland, Littre's gland, and the semilunar caruncle, shew'd no appearance of disorder.

But when I had open'd the remaining part of the urethra, and had seen some of the first of my canaliculi destroy'd; for none of their orifices began to appear, till at about the distance of four fingers breadth from the extreme part of the urethra; examining every thing very attentively, I was struck by the appearance of the ducts of Cowper's gland; the right of which was thinner

(*n*) Mem. a. 1700. & 1711.

(*o*) Annor. eorund.

(*p*) Memor. a. 1711.

(*q*) N. 3.

than natural, and the left thicker : as was seen through the internal coat of the urethra.

Into the thinner duct I in vain attempted to introduce any thing ; so that I suppos'd the parietes either to have coalesc'd from inflammation, or to have been contracted to the narrowest degree possible. The left, on the contrary, was distended with a yellowish and mucous humour ; and seem'd as if it would readily admit a pretty large probe : and did in fact admit it, but from the part of the gland ; for the opposite extremity, that open'd in the urethra, had a very narrow, and even so obscure a termination, that I judg'd it to arise from this cause, that the duct was so full of moisture, and the gland belonging thereto thick ; whereas the other was thin, slender, and contracted.

13. You will here ask, why I conjectur'd that the narrow part of this extremity might have become thus narrow, from a preceding ulcer. Why I call'd to mind, that Littre, in the body, in which alone it is said (*r*) he had found this species of gonorrhœa, had never remark'd any ulceration, but at the edges, and about the edges, of one of the orifices of those ducts ; and that Cowper himself, in the explication of that figure (*s*), wherein he has delineated both those ducts, had taken notice that the orifice of one of them was very large, “ in that subject, from an ulcer.”

And indeed both of them have seen an ulcer at the orifice of the duct ; but they, or, at least, the second of them, an ulcer still eroding ; whereas I, unless deceiv'd in my conjecture, saw one brought to a cicatrix ; wherefore they might see the orifice very open ; and I suppose it to have been constricted from a cicatrix.

And indeed Terraneus (*t*) found the orifice quite obstructed, and the duct surprizingly dilated from thence ; and that on the left side : in which side it happen'd that those three observators, and I, found the disorders of the orifice.

14. But going, from those orifices, farther into the urethra, we come to the second of the two parts in this canal, in which Vesalius (*u*) has not only remark'd, that all, who are affected with a gonorrhœa, “ feel excruciating pain,” but has also given us the reason why they feel a pain in this second part, when the penis is erect.

This place answers to the lower part of the perinæum. For there, as by reason of the flexure of the canal, its steep and very low situation, the corroding humour stagnates ; it there also erodes (or at least irritates) “ more than “ in any other part of the canal ; and when the eroded meatus is stretch'd “ together with the penis, it cannot be but a solution of continuity must be “ perceiv'd in that part.”

And these patients are not only heard to complain, at that time, of an uneasy sensation in this part ; but even when, in attempting to expel the last drops of urine upwards from thence, they compress this part of the meatus, by means of the muscles that lie wrap'd around it.

The gland of Littre surrounds this place : and in that place I suppose the urethra to be ulcerated ; since I have, in that part also, sometimes seen those

(*r*) Supra, n. 11.

(*s*) Vid. in Aët. Erud. Lips. a. 1702. m. Novembr. ad tab. 8. fig. 1. litt. II.

(*t*) De Gland. obs. 6. & fig. 1. ad D.

(*u*) C. 14. cit. supra ad n. 8.

extuberant lines, which I consider as cicatrices ; and as Terraneus (*) found ulcers there from a long-continu'd gonorrhœa.

But these things happen only sometimes. For more generally, I believe that the irritation, and inflammation, of that part, are sufficient to explain what Vesalius says. Now attend to what I myself have seen of this species.

15. A decrepid old man, who had been severely afflicted, for many years, with a lues venerea ; so that you could scarcely understand what he said ; and finally had labour'd under a difficulty of making water, and a gonorrhœa, for twelve years ; was gradually wasted away by these disorders, and, by old age itself ; and died before the middle of January, in the year 1717.

As I dissected some parts of this body in the hospital, I observ'd the following things, which related to the disorders in question.

The uvula, a part of which was wanting, the upper and most posterior surface of the tongue, and the cartilago epiglottis, which had been formerly connected by ligaments, were so full of cicatrices, that nothing could be more so.

Wherefore, that cartilage being unequally contracted, terminated almost in a triangular vertex ; being much more similar to that of a dog than of a human creature.

And indeed the disorder propagated itself into the remaining part of the larynx, and the trunk of the aspera arteria, at that part which was nearest to it : one of the arytenoid cartillages was luxated as it were ; not being parallel to its fellow : but within that artery, large and unequal fasciculi of fibres, as it were protuberated : and on its external surface, at the space of two fingers breadth below the cricoid cartilage, at one side of the membranous, and muscular interstice, a gland was prominent of the bigness, and shape, of a vetch, and of a cineritious colour ; being internally of a red inclining to brown ; that is to say, in a round cavity, which was surrounded by white, and not lax parietes.

This gland I took for one of that great number, there delineated by me (†) : which, by reason of the foramen, going to the cavity of the aspera arteria, being shut up on account of internal disorders, had grown out in this manner, and perhaps more so formerly.

Before we open'd the belly ; for there was no time to open the cranium, and thorax ; we observ'd the most evident cicatrices from buboes of the groins. Then letting alone the other viscera, which seem'd to be in a pretty natural state, we particularly attended to the urinary parts.

The kidneys were very small ; and, by reason of hemispherical protuberances, unequal in their surfaces : yet the substance thereof show'd no disorder, except that it was more firm and compact than usual : although in the pelvis of one of the kidneys, was a little quantity of whitish and turbid serum.

The ureters were much dilated, and were seen to be internally red, almost quite to the kidneys : but both these marks of disease decreas'd, in proportion as they ascended. In the right ureter, I saw the internal coat protuberating, about the middle of the tube, and doubling itself so as to make an annular

(*) De Glandul. c. 5. & obs. 3.

(†) Advers. I. tab. 2. fig. 1.

kind of valve, of a moderate height, which was turn'd against the course of the urine.

As both of them were half-full of a mucous matter; on their internal surface, from the middle upwards, were prominent, here and there, drops (as they were to appearance) of a spherical figure; some larger and some smaller; and having attempted to wipe them away, with the sponge, to no purpose, by applying the knife thereto, and compressing them betwixt my fingers, I saw them immediately resolv'd into a kind of viscid humour, which was ting'd, as it were, with a very dilute colour of tobacco; so that after I found hydatids hanging from the same coat, as I have already written to you (z), I suppos'd these drops, that I am speaking of, to have been of the same kind.

Moreover, the bladder, consisting of very thick coats, through the internal surface of which a kind of thick fasciculi of fibres were seen, join'd together by a various kind of intanglement, overflow'd with a white and turbid humour. Then, beginning the incision of the urethra, from the glans; one side of the corona whereof had been formerly corroded by an ulcer; I scarcely found any thing worthy of remark, till I came to Littre's gland.

This part was, internally, cover'd over with very thick sanguiferous vessels, so as to be far more red, than black, as it usually is. And the prostate gland offer'd no appearance that deserv'd great attention, besides three very short and superficial sinusses, which contracted themselves, from a pretty large orifice, into the form of a cone; and were situated betwixt the seminal caruncle, which was in its natural state, and the orifice of the bladder, according to the length of the urethra.

16. In this body alone, do I remember to have seen the urethra thus affected, in the perinæum: to which affection, however, some cause might be afforded, even by a part of the urine stagnating there; especially in a decrepid old age, and when the urine itself was not in a natural state.

At least this kind of affection was not found in the many others, whom I have describ'd, as having been affected with a gonorrhœa; and not only in this letter, but in others also; and particularly in a certain servant (a) of a miller, who dying at the time of being afflicted with a gonorrhœa; must have had some mark of disease, in the pendulous part of the urethra, which was not allow'd to be dissected; since in the upper part of this canal he had no more than the many others, any mark of disease in any part.

How did it happen then, you will say, to be asserted, with one common voice as it were, that there was a disorder in the prostate gland, and the seminal caruncle.

Without doubt because, as they did not doubt, at that time, but the humour which drips down in a gonorrhœa, if legitimate, is uninfected semen, so they did not doubt, if the gonorrhœa was a spurious one, but the discharge was of semen contaminated with the venereal miasmata.

But afterwards, some of the physicians began to suspect, that what flows from the urethra, in a legitimate gonorrhœa, is not always real semen; as they saw that many did not grow so thin, and become enervated, as they must in course have done, from so great a quantity of humour being dis-

(z) Epist. 42. n. 11.

(a) Epist. 24. n. 18.

charg'd, and for so many years together, as frequently happens, if it were real semen.

And indeed, we see into what an emaciated state, and dejection of strength, they fall, who discharge the semen, in consequence of lascivious dreams, very often, and for a long time together. Some of these persons I have known, who having receiv'd no advantage from remedies, and fearing lest they should be hurried into a fatal atrophy, determin'd, by a kind of happy thought, to tie the penis round about with a band of soft leather, under the very margin of the corona glandis; so that, as long as the penis did not become rigid, they should feel no inconvenience from it; but when it began to grow rigid, that it should immediately create an uneasiness, and the danger of emitting the semen be remov'd, by being rous'd from their sleep.

Moreover, Boerhaave proceeded much farther than the suspicions of these physicians led him, as he expressly denied (*b*) that he had ever known true semen to be discharg'd without a venereal taint, either sleeping or waking; so that it must be a very extraordinary disease indeed, wherein this fluid is spontaneously discharg'd, and without any sensation.

He therefore judg'd the discharge to proceed from the prostate gland.

However, I do not say these things, because I believe that true semen is never discharg'd without venereal cogitations. For I believe, that, where the edges of the small foramina, through which the semen descends into the urethra, are eroded, or very lax; or where the semen itself is very watry; it may flow down without any lascivious idea; as happens to some from the injection of a pretty warm glyster, or from discharging the intestinal fæces when very hard: except, in the former, that which is discharg'd is always in such a small quantity and of such a kind that it is not absurd to account for it from the prostate gland, by reason of its peculiar nature, and being always in small quantity; and in the latter it can never be from the vesiculæ seminales.

But as I know that this does not happen on every occasion, as was formerly suppos'd, so that it does happen sometimes, is out of my power to deny.

17. We are come, as you see, to the last seat of the gonorrhœa in the urethra; I mean the prostate gland, and the feminal caruncle. And if the latter of those parts always shov'd the feminal foramina to be very open, at that time, either by means of laxity or erosion; or if the former were so ulcerated in all persons, that the ulcer reach'd to the feminal canals, which pass thro' that gland; there would be no reason why we should deny, that a flux of real semen must of course happen.

But in many there is nothing of this kind; as not only what I have hitherto written, in this letter, sufficiently shows, almost in general, but the observations of others, amongst whom is Terraneus (*c*), and Blancardus, whom he quotes, confirm; but in particular Littre (*d*), who, from his own inspections, has determin'd the three seats of the gonorrhœa, in each of which the disorder sometimes is, without affecting the two others: and of the three he holds one to be the prostate gland: after this he shows that when the seat of it was in Cowper's glands, the prostate was not affected; and demonstrates with what

(*b*) Prælect. ad Institut. §. 776.

(*d*) Mem. de l'Acad. R. des Sc. a. 1711.

(*c*) De Gland. c. 5. obs. 3. & seq.

difficulty the virus can be propagated into this gland, or into the caruncle from thence.

But notwithstanding the truth of these things; it cannot however be denied, that, in others, nevertheless, (as, for instance, in most of those persons who are troubled with a very virulent, and obstinate gonorrhœa) a disorder has been found in the prostate, and the caruncle.

For to take no notice of what is said by Wharton (*e*), that the small excretory foramina of the prostate gland, which in healthy persons are not conspicuous, “are very evidently distinguish’d in them;” observations are publish’d, and even extant in the Sepulchretum (*f*), by Bartholin, Severinus, and Wirfungius, of the same gland being ulcerated, or affected with an abscess in a gonorrhœa; and after a gonorrhœa, of its being cicatrised: and you likewise read there (*g*), that Guenotius despair’d of a cure in that disease, when, by introducing his finger into the anus, he perceiv’d a resisting tumour of this gland.

Nor are more recent observations wanting, of this gland being vitiated from a gonorrhœa. Two of which, in particular, it may be proper to produce, the one of Brunnerus (*h*), and the other of Genselius (*i*).

For these authors, although they differ’d from each other so much, in regard to caruncles growing out in the urethra, that the first of them said these were nothing more than the figment of the surgeons; as he had observ’d in a certain person, that the impediment to the catheter’s introduction, had not been from a caruncle, which did not exist, but from “a remarkable “stricture, and coarctation, or rather aduction,” of the urethra; almost as I have describ’d above (*k*) in the asthmatic man; and Genselius, who, in another body, had seen a caruncle of this kind, but no coarctation, contended for these caruncles: at the same time then, that they disagreed about these points, they perfectly agreed in this, that the second, in his patient who had been affected with a recent gonorrhœa, after labouring under a virulent one for some time before, had found “several little ulcers about the prostate;” and the first in his, besides “a very great stricture of the meatus,” in that part also, had seen “the surface thereof, about the prostates, very evidently “mark’d with cicatrices, from old and inveterate ulcers, which were then “heal’d.”

But as to what relates to the feminal caruncle itself, you have it, not only in the Sepulchretum (*l*), that Vesalius, in this city, found both the extremities of the vessels, that carry down the semen, and lie on the sides of the caruncle, so as in some measure to escape the sight in other bodies, to be “open and lax,” in a certain man who had labour’d under this disease; but you read also in the celebrated Benevoli (*m*), both an observation of his own, on a man, who had been afflicted with the same disease, almost two and twenty years, in whom was a large and callous ulcer, lying hid in the prostate gland in such a manner, that it only emitted the pus by the caruncle; which

(*e*) Adenogr. c. 31.

(*f*) Sect. hac 31. obs. 5. §. 1 & 2.

(*g*) In Schol. ad obs. 4.

(*h*) Eph. n. c. cent. 1. obs. 97.

(*i*) Earund. cent. 6. obs. 84.

(*k*) N. 10.

(*l*) Sect. cit. obs. 2.

(*m*) Proposiz. int. alla Carunc. c. 3.

was likewise eroded internally by the ulcer; and other observations (*n*) of the same caruncle being ulcerated in a gonorrhœa, that are taken notice of from Genga.

And the caruncle you know is so small, that there can scarcely be an ulcer in it, but it must corrode the extremity of both, or at least of one of the seminal canals; and by this means open a passage, for that fluid to be continually distilling down, even more than when the orifices of the same canals are too lax, and open.

However, the ulcers that are in the prostate gland do not all do this; but only those which are in that part of it, through which one, or both, of these canals are carried; and this part is the highest behind the urethra: but when ulcerous sinusses are brought on from thence, they open a passage for themselves, for pus, and for semen, into the internal surface of the urethra; or, on the contrary, by winding, and creeping, they reach from this internal surface, quite to those canals.

Other ulcers of this gland discharge their pus, mix'd together with the humour secreted therein; either through the proper orifices of the ulcers themselves, which may lie open within the urethra, or through the natural orifices of the same gland: through which, when they are only very lax, and not affected by an ulcer, this humour alone, and not either pus, or semen, is discharged.

And these things I have hinted, that it might be understood, to what class those traces of old diseases, which I have happen'd to see, either in that gland, or in the caruncle, or in both of them, are to be referr'd; and this even though I should be silent upon the subject.

18. And in the first place, I have found superficial traces; as, for instance, those whitish and protuberant lines, the remains, as I suppose, of excrescences; or those three very short sinusses, which I describ'd above (*o*), in the decrepid old man: but others I have met with that were deep, and quite hidden; as you will learn from the following history.

19. In the year 1742, when I began the public demonstrations of anatomy, I made use of the body of an old man, whose disorders I could not get any certain information of; for which reason I shall tell you the more briefly, what preternatural appearances I met with.

The thorax contain'd a heart which was enlarg'd, and had the parietes thicken'd: the beginning of the large artery was wider than it naturally is, and internally distinguish'd with very frequent white spots, of a tendinous nature as it were, not to say bony.

And the belly, which had been previously examin'd, exhibited the same kind of spots in the same artery, as it pass'd through that cavity; though less considerable than in the thorax; if you except one very hard spot, which was at the orifice of the arteria sacra, and seem'd to have render'd this orifice more contracted than the trunk was in proportion.

But as I have already taken occasion to tell you, in the twenty-ninth letter (*p*), what preternatural bodies were seated upon the ring of the pylorus,

(*n*) C. 5.
(*o*) N. 15.

(*p*) N. 17.

or what glands were prominent in the antrum pylori, there is no reason why I should repeat the relation here.

The liver, upon its convex surface, was almost universally become united to the diaphragm. The spleen was thicker than usual, and wider; being internally of a dilute scarlet colour: the arterial branches, which enter'd it, were themselves tortuous indeed, but the trunk of the splenic artery, from whence they came, was, contrary to the usual custom of nature, not at all reflected, or tortuous, in the whole of its course.

The kidneys were longer, in proportion to their breadth, than they naturally are. The coats of the bladder were much thicken'd.

Finally, the prostate gland, where it possesses the anterior part of the urethra, had a cavity, entirely included within its substance, of the figure and magnitude of a middle-siz'd grape; the parietes of which, being of the same colour with the rest of the gland, seem'd to be invested with a kind of thin membrane, as if it were the follicle of the tumour: but within these parietes nothing was contain'd.

20. As it was not at all clear, what had been formerly comprehended in this cavity, and how it had afterwards been remov'd; it brought to my mind what I had seen, a year before, in another old man, of whom I shall speak of to you (*q*), when on the subject of fevers.

That is to say, in the prostate gland, which was enlarg'd, and, in its external circumference, of a red colour inclining to brown, I found within the remaining part of its substance; which was in other respects in a natural state; granules of tobacco as it were, of a yellowish colour inclining to blackness; and those in several places.

These appearances were not far from the internal surface of the urethra; some lying scatter'd up and down at a considerable distance from each other, and some being crowded together into one cavity, much less than that whereof I just now spoke.

Shall we then suppose this larger cavity also, to have been, at one time or other, fill'd with granules of this kind? But of what nature are these granules? For I have found them in many bodies, and not then for the first time.

In the *Adversaria* (*r*), I consider'd them as a humour which is secreted in the prostate, and coagulated into that form: nor do I at present see any reason why I should not consider them in the same point of view also.

Yet what can be the cause, from whence this humour changes its form and colour in such a manner, whether from the lues venerea having formerly preceded, or any other kind of disorder, I leave quite undetermin'd; as I likewise do that suspicion, whereof I gave a hint in a former letter (*s*), I mean whether these granules may not sometimes be the matter of the calculi, that are found in this gland.

Yet I never met with a larger quantity of those granules within this gland, than in the potter; as you will readily perceive by reading over again my seventh letter (*t*): and, in regard to him, you will consider whether you may

(*q*) Epist. 49. n. 18.

(*r*) IV. Animad. 14.

(*s*) Epist. 42. n. 37. in fine.

(*t*) N. 11.

ascribe them to an old lues venerea, that had preceded, by reason of no frænulum remaining at the glans, nor any traces of it; as you also will, in regard to the old man, whose history is given in the twenty-fourth letter (*u*), in whom no more than one of the larger canaliculi of the urethra remain'd; and that in a slender state; at the same time that these granules were not wanting at the sides of the feminal caruncles.

I am inclin'd to add two other examples, in this place, from the bodies of men: and though I am almost altogether ignorant what disorders they had been affected with, yet I shall not scruple to relate what preternatural appearances they had in the other parts of the body also; for I do not think it quite without its utility, as you have seen elsewhere also, to take notice of preternatural appearances; that by comparing them together with accuracy, it may, at least, be known, what marks of disease occur more frequently, or more rarely, in certain ages and habits of body.

21. The body of a man, of four and fifty years of age, who had been gradually carried off by an apoplectic disorder, was given to the college in the year 1728; to begin the public demonstrations from; till an opportunity of getting better bodies should offer itself. For which reason the head was not touch'd. What was found in the belly, and in the thorax in part also, that deserv'd notice, I shall observe at present.

The intestines were lax, and in a manner inflam'd: yet neither these, nor the stomach, had any mark of erosion; so that some recent cause might be suppos'd to have occasion'd that appearance which I shall describe in the duodenum; especially as pus, putrid smell, a thickness and inequality of the lips, and all other marks of ulceration, were wanting.

At the distance of two fingers breadths below the pylorus, was a place, in which the internal coats of the intestines were wanting; and thus an orifice capable of admitting a finger was form'd: and a finger being introduc'd into this orifice, the most external coat of all, which easily gave way in the outward direction, was form'd into a kind of diverticulum as it were.

The spleen was found; but much less than it ought to be, and in every respect very small. The trunk of the great artery had, internally, in that part where it adher'd to the vertebræ of the loins, some considerable bony scales: yet the same vessel was very found within the thorax; as the heart was also.

The urinary bladder was less than it ought to have been, in proportion to the size of the body. In the urethra was nothing particular observ'd; except granules of tobacco as it were, at the orifices of the prostate gland.

22. As to the other man, who was somewhat younger than the former, I have already said, by the way, what his habit of body was; and of what disorder he died; when I was speaking of his hæmorrhoids, in the thirty-second letter (*x*): so that it will be sufficient to add here, what I saw in the upper part of the urethra.

The feminal caruncle had, at the sides of it, granules of the kind I am speaking of; from some of which, that were dissolv'd, as I suppose, by the

(*u*) N. 6.(*x*) N. 10. in fine.

moisture of the place, not only the other parts, which lay near, but even the orifices of the seminal ducts, were yellow.

I observ'd at the same time, that these orifices were much larger than they us'd to be; and of an elliptical figure. And one of them was a little larger than the other.

23. Now as we have begun to treat of the disorders of the caruncle itself, I might; if I had not had occasion already of doing it above (y), or in a former letter (z); give you the relation of other disorders, of the two orifices that are therein, of a contrary nature to those which are just now spoken of; I mean that I saw one of them much narrower than it generally is, and the other quite shut up: and even that it was not in my power to distinguish, and demonstrate, either of them; nor even that larger orifice of the sinus which lies betwixt them, by reason of the caruncles being defac'd by an old lues venerea.

Now then you have my observations, from one extremity of the urethra to the other, according to my promise in the beginning: and such as they are, you are at liberty to make what use you please of them; as they not only relate to those who actually labour'd under a gonorrhœa at that time, or had formerly been afflicted with it, but even to those who might seem to have been affected therewith (*).

24. It does not escape me, that other seats have been assign'd to this disorder, even on the outside of the urethra, and the glands that lie very near thereto; that is to say, in the vesiculæ feminales, in the testes, and even in the urinary bladder and kidneys. Each of which suppositions I shall touch upon slightly, and then put the finishing hand to this letter.

25. In regard to the vesiculæ feminales, besides the opinion of the older authors; and among these of Riolanus, who is quoted in the Sepulchretum (a); we should have observations of Littre, if he had executed what he promis'd (b), when he treated of the gonorrhœa of Cowper's glands.

However, it is easy to conceive, that, when the seminal canals, which go through the prostate gland, and open in the caruncle, are eroded, the disorder may be easily communicated to the vesicles.

A proof of this circumstance was perhaps offer'd to me, at the time, when, in a young man of five and twenty years of age (c), I found the vesicles so contracted, and without moisture, contrary to the general habit of that season of life; for the same virulent inflammation, which had formerly contracted the extremity of one of the seminal ducts, and had shut up the other, might be propagated into the vesicles, and destroy them.

Yet I would not have you suppose, as often as ever it happens, to any person labouring under a long, and terrible gonorrhœa, to emit a bloody semen in consequence of lascivious dreams, or a semen that is foetid and contaminated with fordes and pus; I would not have you, I say, suppose in these cases, that the disorder is necessarily propagated to the vesicles: for it is possible that purulent, and foetid fordes, and a small quantity of blood, may be

(y) N. 7.

(z) Epist. 40. n. 29.

(*) Vid. etiam Epist. 60. n. 12.

(a) Sect. hac in Schol. ad obs. 4.

(b) Mem. de l'Acad. R. des Sc. a. 1711.

(c) Supra n. 7.

swept away, and carried down, from ulcers that occupy the urethra, the prostate gland, and feminal caruncle, by the ejaculated semen, which is in other respects sound.

For it does not always, and of course, follow, that the disorder is communicated to the vesicles, even from the ulcers of those neighbouring and last-mention'd parts; notwithstanding I have said that it may be communicated without difficulty.

26. But is the transition of this disease, from the vesicles into the testes, equally easy?

That the virulent matter regurgitates from the vesicles into the testicles, that these glands become tumid thereby, and are in part the seat of the gonorrhœa, when the discharge of the matter is prevented by the force of astringent remedies, Wharton has taught us (*d*); for the words of this author are, although this is not very clearly shown in the Sepulchretum (*e*), nearly what de Graaf (*f*) has not only follow'd, but copied; even at the time, when, to confirm this, he says that the gonorrhœa of women, "without doubt, proceeds from their testes," as they have no prostates.

Yet de Graaf must, of course, have rejected this confirmation afterwards (*g*), when he asserted that women not only have prostates, but are without any fluid semen in their testicles.

But if Wharton, or de Graaf, at the time when he follow'd the opinion of Wharton, had call'd to mind the observation of Panarolus (*h*); who says that in a woman, who died after a continual gonorrhœa, "a vomica was also found in one of the testes;" they would, perhaps, have drawn an argument from hence, in favour of this their opinion; but a very weak one; since Panarolus has not entitled that observation (*i*), which is not accurately copied, as Bonetus has done, by prefixing these words, "a gonorrhœa generated in a woman by a vomica in one of her testes;" but has given quite a different view of it, by saying, "a vomica in the testes of a woman, from an old gonorrhœa."

For there is no doubt, but the venereal virus may be carried, from the seat of an old, and long-continued gonorrhœa, into the ovaria also; as well as into other parts; after it has been absorb'd by the lymphæ-duets, or by the sanguiferous vessels, and has infected the whole mass of blood: nor does that passage from the vagina, through the hypogastric arteries, to the ovaria, which has been thought of by Vercelloni (*k*), please me any better than many other things which we read in his work; as if the arteries receiv'd any thing, from the parts near to which they pass, to transmit to some distant parts.

The seat of the gonorrhœa, then, is not to be suppos'd in the testicles of women, from the observation of Panarolus.

But must we not, at least, allow it to have a seat in the testicles of men?

(*d*) Adenogr. c. 31.

(*e*) Sect. hac Schol. 2. ad obf. 5.

(*f*) Ibid. Schol. ult. ad obf. 1.

(*g*) De Mulier. Organ. Generat. c. 6. in

fine.

(*h*) Pentec. 1. obf. 14.

(*i*) 6. in sect. hac.

(*k*) De Morb. Pudend. c. 3. §. 3.

We may allow of it with somewhat less difficulty; supposing it be confirm'd however, by other observations, besides that of the tumour of these parts, when the discharge of a gonorrhœa is suppress'd by astringents.

For it is by no means necessary, if the tumour of a part follow the violent and sudden suppression of any discharge, to have immediate recourse to this supposition; that the matter had before flow'd from the now tumid part, or has, at present, regurgitated into it.

Yet that, by the improper use of astringents, the irritation and inflammation may be increas'd, and propagated from the upper part of the urethra, and the adjoining vesicles, by the vasa deferentia, to the testicles, and that this may be so much the more easily, and speedily produc'd, also, to such a degree, as the passage of the semen betwixt these vessels, and the testicles, is almost intercepted, and by this fluid, which is, consequently, retarded in its course, the testicles are distended; and finally, that the matter, which was discharg'd by the urethra, may enter the general channel of the blood, and be carried therewith into the testicles; we do not deny.

But you see that there is one of these methods, I mean the second, by which you may conceive of the testicles being tumid, and yet not infected with a venereal contagion; and consequently not become the seat of the virulent gonorrhœa.

27. And the passage from the urethra to the kidneys, is not a little longer than to the testicles: and yet, that the disorder, if it is continued for a very long time, may creep to a distance from the urethra, "and infect the bladder" and ureters, and at length even the kidneys themselves," is affirm'd by Dodonæus (l).

For I have observ'd, that they are the words of this author, which you will read in the first part of the Scholium, to the fourth observation, of this thirty-first section of the Sepulchretum, which is taken from Dodonæus himself; but neither there, nor in the title to which we are refer'd, *De Hypogastrii Doloribus*, that is in the twenty-third section, where it is given under observation the sixth, article the fourth, is it wholly copied: since neither in one place, nor the other, mention is made of the whole urethra being ulcerated, and fill'd with coagulated blood.

But that the disorder should creep so far as to the kidneys, "a long continuance" is, as you see, requir'd by Dodonæus; and the gonorrhœa, which is spoken of in that observation, had lasted eighteen years.

However, in what manner, where the bladder is ulcerated, the disorder may be communicated still much sooner, by the urine, to the ureters, and kidneys; I have already shown in a former letter (m): from which place you might prudently select some things as joint causes, if there were any occasion, and accommodate them to this observation of Dodonæus; not to mention three of mine which are not far unlike it.

For, in so long-continued, and so severe a gonorrhœa, what a dysuria, and what a strangury, there must have been sometimes, is sufficiently apparent; and the bladder being *plane rigida*, quite rigid (not *plane frigida*, quite cold,

(l) Medic. Observat. c. 41.

(m) 42. n. 23.

(n) Supra, n. 15. & Epist. IV. n. 19. & XLII. n. 40.

as, by a typographical error, it is most stupidly perverted in the Sepulchretum) “ could neither be distended nor contracted.”

But that the kidneys may be vitiated from long and repeated gonorrhœas, without the bladder’s being affected, appears very clearly, and evidently ; even from that history of Valsalva, which I gave you in the beginning of the same letter (*a*) ; the disorder, consequently, not creeping on from the urethra, but entering into the passages of the blood, and passing on, through those, to the kidneys.

However, be this as it will ; I shall not suppose the bladder, the ureters, and the kidneys, to be the seat of the gonorrhœa for that reason ; not only because no semen, nor fluid relating thereto, flows down from those parts ; but also because an ichor distilling therefrom, cannot, unless the sphincter of the bladder happens to be injur’d, come, at any time, into the urethra, by drops, without urine, and bely a gonorrhœa. But it is time to conclude. Farewell.

(*a*) N. 2.

LETTER the FORTY-FIFTH

Treats of the Descent of the Uterus, and likewise of
the Ascent, as Women call it.

WHAT Hippocrates has said (*a*) ; that “ the uterus, when mov’d “ out of its natural situation, to any other part, brings on diseases, “ whether it proceed outwards, or be retracted internally ; ” will be the subject of this letter, which will answer to the two next sections of the Sepulchretum ; that is, to the thirty-second, *De Uteri Procidencia Descensu & cæt.* and the thirty-third, *De Hystericiis Affectionibus, Suffocatione & cæt.*

For I thought it proper, to comprise these two species of disorder in this one letter, lest it should, perhaps, be too short ; since Valsalva has left no dissections, which relate to these disorders, and I have very few : I hope, however, you will receive these, such as they are, with a willing and attentive mind, as you have receiv’d those that I have sent you hitherto.

2. First then, in respect to the prolapsus, or descent, of the uterus, you know very well that, with Fernelius (*b*), there was then a descent of the ute-

(*a*) De loc. in hom. n. 59.

(*b*) Pathol. l. 6. c. 16.

rus, when it had fallen downwards, though it had not yet fallen outwards; and a prolapsus, when it is inverted and thrown out of the body; which can happen only from the great violence of labour-pains: except that it may sometimes, also, happen, from the rashness of an imprudent midwife, who takes away the secundines with violence.

And he would have treated of the subject fully, if he had not omitted another kind of prolapsus; I mean that kind in which the uterus does not invert itself, but being shut up within the inverted vagina, is prolaps'd outwards.

For in the descent of the uterus also, the vagina must of course invert itself, in the same proportion as the uterus descends. And this part inverts itself, from the same external, or internal causes, that give occasion to the descent of the uterus; that is to say, those which at the same time distend, or relax the ligaments of both these parts, and among these causes, how we may reckon the uterus itself, and the vagina, I shall show you below (*c*).

Besides these true descents, or prolapses, of the uterus, there is also a prolapsus of the vagina; not only the more slight, but sometimes so great a one, and of such a kind, that it may be taken for the prolapsus uteri, which I took notice of in the second place; one of which kind you will see describ'd, and represented in a plate, by Jo. Gulielmus Widmannus (*d*); who found it to be made up only of the internal coat of the vagina.

3. All these species of disorder we, also, allow to have been taken notice of by the ancient physicians; and even by their most ancient master Hippocrates; if you except that kind of prolapsus, in which the uterus inverts itself.

Yet that this was hinted at by Celsus (*e*), I think I have sufficiently shown in my fourth epistle upon him. And that, in the books of Hippocrates, not only the prolapsus vaginæ is taken notice of, under the title of "the uterus falling outwards (*f*)," the cure itself shows; but also, that the true descent of the uterus, and the second kind of prolapse, are taken notice of, the following words show: "but if the uterus is very near to the external parts" (*g*), and "if the uterus falls quite out of the pudendum; it hangs down like a scrotum (*h*): but if the os uteri fall down on the outside of the pudendum, &c. &c." (*i*).

As almost all these things were justly, and deservedly, preserv'd by their descendants, without any doubt, down so low as the remembrance of our fathers; and as even many persons, some at one time and some at another, had not doubted that the uterus, when prolaps'd, has been extirpated, without destroying the woman; and that not very seldom neither, though, to confess the truth, with too great a credulity; not to say any thing of those who had gone so far, as to contend, that children, by the special grace of God, had been procreated by these women afterwards; there arose at length, as you will learn from the Sepulchretum, some men skilful in anatomy, and surgery; who, although they, with great justice, argued against the excessive

(*c*) N. 12.

(*d*) Eph. n. c. cent. 8. obf. 98.

(*e*) De Medic. in Præfat.

(*f*) De Exfect. fœt. n. 4.

(*g*) De Morb. Muliebr. 1 2. n. 37.

(*h*) Ibid. n. 38.

(*i*) Ib. n. 39.

credulity of others, yet did not run counter to it with the greatest propriety: as they not only granted some things, which they ought not to have granted, but, moreover, even denied those very ancient, and sound dogmata, relative to the prolapsus uteri; and what is still more surprizing, made some celebrated masters in both these faculties, and in medicine, their followers and sectaries.

4. For that the uterus has been, sometimes, really cut out, “in an extraordinary and very rare case,” yet that the woman has surviv’d, why should we not rather say with Georgius Wolffg. Wedelius (*k*), than that it never has been, with Jo. Guilielmus Pauli (*l*), who treats of this subject, in other respects, learnedly?

For it is too hard to pronounce, that, out of so many who have asserted this to have been done, or seen, by them, there could not be any one that was not deceiv’d?

And certainly if the observation of Slevogtius (*m*), had been then publish’d, or had come to his hands; he would at least, as well as Abraham Vater (*n*), have acknowledg’d this to have been free from all deceit.

For Slevogtius, upon cleansing, from its fordes, a large body, that was cut out from the pudendum of a woman; which he suppos’d to be an excrescence; contrary to his expectation found it to contain the uterus, like a thick bag, together with the remains of its tubes, and in a natural state: and this was seen by the professors at the university of Jena, by most other physicians, and by a hundred students: yet this woman was very happily restor’d.

But if you interrupt me by inquiring, why neither this woman, nor any other, was immediately carried off; either by a considerable hæmorrhage, from some of the larger vessels of the uterus being cut through, or, soon after, by the large wound, which, when the bladder hangs downwards, together with the uterus, must necessarily be inflicted thereon, as is remark’d by Ruysch (*o*); to the first, I shall, perhaps, answer, that the vessels being long distracted, and therefore contracted, and a corruption moreover gradually helping the separation, as is the case in the flesh, that is dead from a sphacelus, no great quantity of blood could be pour’d out: and to the second, either that the vagina was inverted only in its upper part, or was not inverted in the external coat, whereby it is join’d to the bladder; but only in its internal coat; so that it could not draw the bladder down with it.

But if you cannot approve of these replies, and suppose the circumstances to have happen’d; for I am not universally pleas’d with them myself; you will, of yourself, endeavour to find out better hypotheses: for we must take care that we do not seem to distrust Slevogtius, or any other author of eminence and credit, who asserts that he had examin’d the case, either in the body that had been extirpated, or in the carcase after death.

I could wish Molinetti had made this examination (which he could have done easily and well) as he says (*p*), that “he had always experienc’d” the

(*k*) Dissert. de Procid. Uteri. c. 4.

(*l*) Progr. addit. Diss. Schacheri de Placentæ Morbis.

(*m*) Vid. in calce obs. Van Sanden de Pro-lapsu Uteri.

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(*n*) Diss. de Sarcom. e Pundend. Muliebr. & cæt. thef. 7.

(*o*) Thef. Anat. 8. n. 102.

(*p*) Dissert. Anat. Pathol. 1. 6. c. 12.

method of amputating the uterus, “to be very safe; and that he had “made use of it many times, especially in old women:” in whom, as the inversion of the uterus, whereof he says these things, is more rare, so ought the examination to be made with the more accuracy after amputation; lest any error should have crept in: the suspicion of which, that perpetual felicity of cure seems to increase.

There is even another much more recent observation; of the uterus being inverted, and successfully cut out; in which you would wish that the examination, after excision, had not been omitted; as before this, the case is said to have been similar to that related from Wepfer, in the *Ephemerides* of the famous Academy *Naturæ Curiosorum* Dec. 2. A. 5. Obs. 50; where you not only do not find the uterus inverted, but even an excrescence, which Wepfer himself had shewn (q) might belong rather to the vagina, than to the uterus: and he even affirm’d it to have belong’d thereto, from what happen’d to the woman, in the space of two years afterwards (r).

Nor indeed ought we to require an accurate examination of the uterus, when inverted, only, but also when prolaps’d outwardly, with the vagina, in the living and dead body; especially after it is certain from the observation of Widmannus, which has been quoted (s), that the prolapsus of the inverted vagina alone, may sometimes so impose upon the observer, as to make him believe that the uterus was prolaps’d within it, at the same time.

For if you compare the figures of Ruysch (t), which express this second case, with the figure of Widmannus, which represents the first, you will find no difference; to omit other things; in that which was consider’d as the chief sign to distinguish one from the other.

That is to say, as the os internum uteri, is in the middle and lower part, of the prolaps’d body, in the figures of Ruysch; so you would also suppose that you perceive it in that of Widmann: whereas the dissection will shew, that it was only an appearance, made up of the vagina; as by this the internal coat of the vagina, being much thicken’d, was itself found to be prolaps’d; but the uterus was found in its natural situation.

By what means then, you will say, shall we distinguish the case in a living woman? A thing of the last moment, certainly, where the question is of amputating the tumour!

The same enquiry has been made by Abraham Vater (u), as by you. But he has determin’d nothing: and has even declar’d, that any obvious sign is useless, depending upon that very dissection of Widmann.

To me however, from another certain circumstance, which, being observ’d before the dissection, by Widmann, made him begin to doubt whether that which seem’d to be the uterus was really so or not; to me, I say, a thought arose, of taking a sign from this very circumstance, whereby we may know whether such a tumour be made up of the uterus or not.

For without doubt, if a long probe be introduc’d through the orifice, which appears to be that of the uterus, and the same thing happens to the introducer, that happen’d to Widmann; I mean that the probe may be

(q) In Schol. ad n. 4.

(r) Dec. ead. 2. a. 7. obs. 54.

(s) Supra, n. 2.

(t) Obs. Anat. Chir. fig. 2. 8. 11.

(u) Dissert. de Polypo ex Utero egresso thes.

push'd, without any obstacle, far beyond the natural length of the uterine cavity, and yet not come to the full extent of the prolaps'd body; and the tumour is, at the same time, not eroded by an internal putrefaction; a proof, in my opinion, will be given, that this orifice does not belong to the uterus, but only to the vagina; and such a proof as, to my apprehension, ought not, in an ambiguous, and very difficult case, to be despis'd: but if the contrary happens, to the contrary conclusion may we fairly be bias'd.

And if they who have contended that the uterus never descends, nor is prolaps'd, had examin'd the case very frequently in dead bodies by dissection; they would have thought, that we were not under a necessity of refering all the observations, of others, to the prolapses of the vagina alone, or to the excrescences of that, and the os uterinum: as if, in fact, it were impossible, that what they themselves had not seen should ever have been seen by any other person.

5. Indeed we very readily, and without any reluctance, grant these gentlemen, that they who assert their having cut away the uterus, have been, almost all of them, deceiv'd by excrescences of that kind; or by prolapses of the vagina: and this also must be confess'd, whether they are willing or not, by those who have told us that the women have brought forth children after the excision; unless they should perhaps contend, that two of the most extraordinary things imaginable, had happen'd in one and the same woman; first, that she should survive the excision of the uterus; and secondly, that she should have a double uterus from the original formation.

But, as I had begun to say, does it follow from this; that so many surgeons have been deceiv'd in taking excrescences, and prolapses of the vagina, for the uterus; does it follow, I say, from hence, that all have been equally deceiv'd, who have asserted that they have seen a descent of the uterus, or a prolapsus thereof?

That this certainly does not follow, not only reason itself evidently shows; but also a great number of observations, which may be added to some that are produc'd in the Sepulchretum, demonstrate.

Slevogtius (x) will point out these observations, though I am silent; and Van Sanden (y) likewise; who is very full in collecting those observations, which belong to this section of the Sepulchretum; that is the thirty-second: in the additamenta of which section, it is surprizing, in the first place, that those observations should be wanting, which might, at that time, have been taken from the Centuria of Ruysch; and in the second place, that we do not meet even with the observation which we find in that well known book of Bohn, and which I shall take notice of presently.

To these you will add those that were not then extant; part of which have been already refer'd to, and part of which will be refer'd to below; and others besides these, either of the descent of the uterus, or of the prolapsus of it; to which belong one of Vater's (z), and one of the celebrated Philadelphus Boehmerus (a): both of which, as well as the others, are very clearly confirm'd by dissection.

(x) Dissert. de Muliere gravida lapsu Vag. Uteri, & cæt. §. 12.

(z) Dissert. de Polypo & cæt. ibid. cit. thes. 8. in fine.

(y) Obs. supra ad n. 4. cit.

(a) Dissert. de Prolaps. & Invers. Uteri, in Præfat.

6. However, although "the sight of an inverted uterus, is too rare" to physicians, and surgeons, as I have written in that epistle upon Celsus (*b*); and although de Graaf has said (*c*), that "this happens very rarely;" yet that this is not very rare to midwives, and especially to the unskilful, and happens very often in the child-bearing women of some countries, I understand from books; and in particular from the second Decade (*d*) of Ruysch's *Adversaria*.

For it appears plainly from thence, that the uterus is not always forc'd down, and inverted, by the unskilfulness of midwives; nor from the violence of pains, at the time of child-bearing; but also from the attempts made "to unload the uterus, after birth."

There is another cause besides, but, in regard to this effect, far more rare; I mean when a very large excrescence, that had form'd itself upon the fundus uteri, inverts the uterus by its weight; and draws it downwards, in the manner that Sandenius has propos'd (*e*).

And it is certain that anatomy shows the uterus to have been inverted; for within its cavity, form'd by that surface, which had been before external, the ligaments of the uterus, the Falloppian tubes, and the ovaries, have been found to be contain'd.

And in this way you will very easily conceive how it could happen; in the observation transferr'd into the Sepulchretum (*f*), from Henricus ab Heer, upon a uterus cut out by a mountebank; that a considerable part of the intestine colon was prolaps'd, and was amputated together with it; in consequence of being contain'd within its cavity, when inverted.

You will also gather from an observation of Sandenius (*g*), that a woman may sometimes live many weeks with the uterus inverted, and not replac'd; and even from the cure of Genselius (*h*), that the woman has been sav'd by restoring the uterus, at length, to its situation, after having been displac'd for many days.

But these things are rare, if you compare them with so many other cases that were speedily fatal; to which we must add that produc'd by Bohn (*i*), of a woman, who had brought forth her first child, dying within less than an hour after the uterus had been violently drawn down from its seat, which was found to be empty; and that also related, from Chapman, by Boehmerus (*k*) already quoted; in which, if I rightly understand it, the woman died still sooner from the like accident.

The other prolapsus of the uterus likewise, that is without inversion, is neither so frequent, that "Blasius, in his commentaries upon Vesslingius, related "a whole catalogue of the observers of it," as de Graaf has blunderingly written (*l*); nor yet, on the other hand, so rare, that "nobody besides "Ruysch" has ever seen it; which would never have escap'd Widmann (*m*),

(*b*) IV.

(*c*) De Mulier. Organ. c. 10.

(*d*) C. 10.

(*e*) Obf. supra ad n. 4. cit.

(*f*) Sect. hac obs. 6.

(*g*) §. 27.

(*h*) Act. Erudit. Lips. A. 1716. M. Maj.

(*i*) De Renunc. Vulner. sect. 2. c. 4. vers. finem.

(*k*) Dissert. supra ad n. 5. cit. §. 13.

(*l*) C. cit. 10.

(*m*) Obf. supra ad n. 2. cit.

if he had not forgotten, as frequently happens in such cases, the observations of Platerus (*n*), and Peyerus (*o*).

The descent of the uterus rather, and the prolapsus of the vagina chiefly, occurs pretty frequently. It has therefore happen'd, that I have never heard of the prolapsus uteri, when inverted, more than once, in this country; and of the uterus, without inversion, not so much as once.

But the descent of the uterus, and the prolapsus of the vagina, I have sometimes seen, not only in the living body, but made observations upon, in the dead.

7. Being ask'd to examine the genitals of a woman of reputation, about five and twenty years of age, in order to determine the nature of a certain body, of a round figure, like a penis, which hung down within the vagina; I immediately perceiv'd it to be the cervix uteri, which had fallen down below the middle of the vagina.

The osculum uteri, as, though the woman was married, she had never born children, was narrow, and almost in the shape of a circle: and from thence I saw a little blood proceed; for the woman had lately menstruated; so that if any one should doubt whether the menstrual blood comes from the uterus, or not, he might have been convinc'd by this inspection.

But now I will tell you what we have observ'd in dead bodies; first in beasts, and after that in women; for by this means it will be clear and evident, that these disorders are brought on, not only by weight, but by other causes also, which act on our bodies, according to the mechanism thereof.

What I shall first relate I formerly receiv'd from Valsalva.

8. When he was dissecting a bitch, which died pregnant, he found the vagina inverted; and the adjoining uterus considerably nearer to the orifice of the vagina than usual. And this change in the situation of the uterus was also confirm'd by the cornua, and especially the right; in which were three young whelps. For they had follow'd the uterus towards the vagina, and not at any great distance.

9. A cow, which had been subject to a prolapsus of the vagina, the master of her would have to be kill'd for this very reason, when she was advanc'd seven months in her pregnancy; fearing lest she should die in bringing forth her young; so that her viscera, and flesh, would be sold at a very low price.

Having got the vagina, together with the uterus, I found the former inverted to some considerable extent; where it is connected with the extremity of the cervix uteri. But in that part it was not without ulceration. What I observ'd in the uterus and the foetus, was agreeable to their nature; for which reason it does not belong to this place.

10. But as, in these brute animals, the disease could not be imputed to the weight forcing or drawing downwards; so in women I believe that it frequently may be: as it might in her of whom I shall speak immediately.

11. An old woman of Bologna had already been hemiplectic many years, so as not to be able to move one side of her body; when at length she lost the power of motion in the other also. The same woman was said to

(*n*) L. 3.

(*o*) In Additam. ad hanc Sepulchr. sect. obs. 5.

have a certain round body prominent from her genitals. Last of all she was seiz'd with an inflammation of the thorax, and died in this hospital; where we dissected her body about the year 1704.

The thorax we did not meddle with; being taken up with other dissections.

The head, which was open'd by some of my friends, show'd nothing worthy of notice; except serum betwixt the dura and pia mater.

I myself examin'd, with some accuracy, the thyroid gland; as it was tumid, and very hard; and the belly likewise, as to what related to the uterus, and the other genitals. What I found in that gland is sufficiently shown elsewhere (*p*).

But in the belly, I observ'd that the fundus uteri had a somewhat lower situation than it generally has; yet not so much as to make me suspect, that the orifice thereof could come where it really did, as I shall tell you presently.

On the outside of the labia of the pudendum, which was much dilated, a body of the length of three or four inches was prominent: this body was of a cylindrical form, very thick, made up of a substance, similar to a ligament, and smooth; unless where it was ulcerated at the bottom.

That it was the vagina inverted I readily perceiv'd. Wherefore, at the upper anterior part of this body, was the orifice of the urethra; and under this, on each side one, were foramina of lacunæ considerably dilated.

And in the middle of the lower part was an orifice, that soon led to the osculum uteri, through which I pass'd a probe, without any difficulty, quite to the upper parietes of the cavity of the uterus.

Being surpriz'd at this unusual length, I cut into the vagina; and within it I found the cervix uteri contain'd, having become very much longer than it naturally is: nor was this to be wonder'd at; since the parietes of the cervix itself, and the fundus uteri, were not firm, as they are in their natural state, but extremely lax, and flaccid: as all the other parts, that had their seat in the pelvis, and belong'd to the uterus, were likewise.

12. It is evident that the uterus, whose fundus was somewhat lower than usual, had been drawn downwards by the weight of the vagina thus thicken'd; unless the cervix, from the very beginning of the disorder, suppose, was of such a laxity, as to suffer itself to be drawn downwards more than the other parts, and be distended into that extraordinary length: for I do not imagine that length of it, which Vaterus (*q*) tells us was seen by him; when, on one hand, the prolaps'd vagina drew the uterus downwards, and on the other the enormous size of the ovarium prevented it from descending any farther; to have been comparable with this.

But in another woman, whom I describ'd to you in the thirty-fourth letter (*r*), the increas'd thickness, and, consequently, increas'd weight, of the corpus glandosum urethræ, had indeed drawn the uterus somewhat downwards: but because the cervix was not of such a laxity, the orifice had not descended so far; for which reason this very corpus glandosum, being perforated,

(*p*) Epist. Anat. 9. n. 39.

(*r*) N. 11.

(*q*) Diff. de Sarcom. & cæc. supra ad n. 4.
cic. thes. 3.

in the middle of its lower part, with the orifice of the urethra, resembled the orifice of the uterus. Nor, indeed, could the weight of the uterus be there accus'd; as it was but small, and the parts of it but thin.

Yet in saying this, I do not necessarily deny, that a uterus, overloaded by a weight which is preternatural, does, in other women, invert the vagina; and hurry it downwards together with it; a very clear instance of which you have in the observation of Hartmann, that is related among the Additamenta to the twenty-first section of the Sepulchretum (s).

You see then, that not only the weight of the vagina, by distracting the ligaments of the uterus, sometimes draws this downwards to the lower parts; but also that the weight of the uterus, at other times, by distending the parts which connect the vagina, inverts this cavity, and draws it downwards with itself.

For both the ligaments of the uterus, and the connecting parts of the vagina, do suffer themselves to be distracted; as they are membranous, and frequently very lax from internal causes; and this distraction, whereof we speak, is often known to be coming on gradually, and for a long time together.

That prolapsus uteri, which Peyerus (t) has describ'd, was certainly large; as the uterus was push'd out at the pudendum, and hung within the inverted vagina. "Nevertheless," says this excellent anatomist, "the ligaments of the uterus, and bladder, were not ruptur'd, but only relax'd."

And he said, "the ligaments of the bladder, because the urinary bladder had fallen down, together with the uterus, and chang'd its situation;" as he found by dissection; which circumstance, though it then seem'd to him "wonderful, and altogether new," Ruysch (u) has since admonish'd will always necessarily happen, in prolapses of this kind.

13. And if these cases seem to be very surprizing, which are, nevertheless, generally brought on by degrees, as I have said, and in a long course of time; that certainly deserves our admiration, which, though it is much less, is brought about very speedily, and in a short time, by nature itself.

For in the birth; to use the words of Slevogtius (x); "the osculum uteri comes very near to the orifice of the vagina, and distends it, from a long pliable canal, into a large circle; corresponding to the size of the embryo which is to pass through it."

And, indeed, where, by reason of the thickness of the foetus, and the narrowness of the passages, the birth is brought on but slowly, and with considerable difficulty; "it then frequently happens, that, by the continued exertions, of the woman, to bring on the delivery, the opening of the matrix is evidently propell'd by the head of the infant, and carried to more than the length of an inch, or two, on the outside of the vulva:" for this appearance, which Munnickius had suppos'd to be very rare; Slevogtius testifies "had frequently occur'd to himself; and had not portended any mischief."

(s) L. 3. obs. 54.

(t) Sect. hac 32. Sepulchr. obs. 5.

(u) Loco supra indicat. ad n. 4.

(x) Dissert. supra ad n. 4.

But this is still more surprizing; that, though a gravid uterus hanging down within the inverted vagina, beyond the lower parts of the pudendum, the foetus has, nevertheless, been brought forth.

And that observation of Harvey (*y*) himself, which is, as far as I know, the first of the kind, you will add to the others that are collected by Sandenius (*z*): whereto that also belongs, which was afterwards propos'd by that excellent professor at Helmstad, Fabricius (*a*).

And although such a number of observations may serve to convince those, by whom the prolapsus uteri, within the inverted vagina, was denied; in the same manner as that observation may, which the celebrated Friedius communicated to Widdmann (*b*); yet here I would have you attend only to those of them, that represent the uterus to be thus prolaps'd in the very birth.

For you will be less surpriz'd after this, that those distractions of the ligaments I was speaking of (*c*), which come on gradually, and in a long space of time, may happen; especially as women thus affected, are not without a troublesome sensation, that corresponds to these distractions, and either do not discharge the contents of the rectum, or bladder, or both of them, with their usual facility: which difficulty, in a certain woman whose vagina was prolaps'd outwardly; as it was reliev'd by raising up this prolapsus; Slevogtius (*d*) accounted for, not so much from the compression of those meatusses, as from the distortion thereof, on account of the annex'd fibres of the pendulous vagina, drawing them in an oblique direction; and by this means constringing, and making narrow, their cavity.

However, he made the connexion of the vagina much larger than it really is; as he thought (*e*) "that the vagina was very closely connected, in its whole length, to the subjacent intestine."

14. It is true, I do not deny that the doubts, which have been already advanc'd by me (*f*), cannot be entirely remov'd from my breast; except by a previous and very accurate examination, of the bodies, of those who labour'd under these diseases: an opportunity of which examination I have not had for a long time.

Among these I, without doubt, confess the prolapsus vaginæ to be the most frequent; and grant that it has impos'd upon many, for a prolapsus of the uterus.

But does the internal membrane of the vagina, relax'd, and extended, by an afflux of humours, fall down of itself only? Or do both of them fall down?

That the former "happens very frequently," not only many authors, among whom is Wedelius (*g*), assert; but even, according to the assertion of Widmannus (*h*), "all agree."

And indeed, where you put the case in this point of view, you make some

(*y*) In Addit. ad Exercit. de Generat. ubi de Partu.

(*z*) Obf. supra ad n. 4. cit. §. 6. & seq.

(*a*) Program. quo facil. Extract. Fœt. in Procid. Uter.

(*b*) Obf. supra ad n. 2. cit.

(*c*) N. 12.

(*d*) Dissert. modo indicat. §. 16.

(*e*) Ibid. §. 11.

(*f*) Epist. 33. n. 15.

(*g*) Dissert. supra ad n. 4. cit. c. 1 & 2.

(*h*) Obf. supra ad n. 2. cit.

of the difficult circumstances easy to be understood; one of which I have hinted at above (*i*); and another is pointed out by Wedelius (*k*).

But in the mean while; especially if the prolapsus is of a great length, and still more, if, as Widmannus (*l*) proposes it, the internal membrane, being torn away, from the upper part to the lower, and reflected downwards, occasions the prolapsus; you must, of course, fall into some of these doubts, which I have said are already pointed out by me.

Yet the inversion of all the parietes of the vagina, at one time, is not very easy to be explain'd.

Besides, suppose which you will of these two circumstances, it is not so clear how these parts, by the assistance of remedies, can, sometimes at least, recover their former situation, and remain therein; after such distractions of the ligaments, and connecting parts.

15. One remedy made use of by art; besides others, both externally and internally applied; is that of pessaries constructed in the form of a ring, or any other shape, which has a foramen to it. And we must not omit to make use of this kind of remedy here also; as we frequently must in the prolapsus of the intestinum rectum.

For there are two circumstances, in this case, which render the cure more difficult than in the other; first, the inevitable weight of the uterus, when it has fallen down before, again inverting the replac'd vagina; and secondly, the sphincter muscle keeping the orifice, of the vagina, shut up neither so strongly, nor so closely, as the sphincter ani does the orifice of the intestine.

And for these reasons, then, the vagina is again push'd outwards, resembling either an intestine, or some other body; as, for instance, from what we have seen in Hippocrates (*m*), "the scrotum;" which it also resembled in the observation of Harvey (*n*).

That a disorder which is indecent, or, certainly, inconvenient, may be remov'd, or at least conceal'd, these pessaries have been invented. And if all the instruments of this kind; of whatever form, or structure; that have been yet known, "were so far from curing" a prolapsus uteri, "that they generally made it worse;" as I lately read in the works of a learned man; they would have been long ago rejected by physicians, and surgeons, and even by women themselves.

I, however, observ'd this instrument to be rather useful, when I dissected a woman who had been subject to this disease; as I have already written to you (*o*).

Yet I do not deny that where they are introduc'd with violence, or improperly, and foolishly constructed, they may either bring on death, as was seen to happen by Benevoli (*p*), or some detriment at least; especially if the women, nevertheless, persevere a very long time in the use of them: and do not ever take them away, even for the sake of wiping and cleaning them.

(*i*) N. 4.

(*k*) Diff. modo indicata c. 4.

(*l*) Obs. indicata.

(*m*) Supra n. 3.

(*n*) Loco supra ad n. 13. indicato.

(*o*) Epist. 22. n. 22. in fine.

(*p*) Observaz. 3.

You may see, in the *Commercium Litterarium* (9), what happen'd to two women for the same kind of reasons.

You will find that one of them; having introduc'd a ball of thread, or worsted, wound up together, had a tartareous matter, as it were, concreted upon it, to such a height, as every where to equal three fourth parts of an inch; and of such a hardness, that it could not be chipp'd off without an instrument for that purpose; and, finally, that it gave such uneasiness as already to have brought on a very severe strangury: and that the other had an ulcer of the vagina, and the neighbouring intestine, in consequence of an iron pessary; notwithstanding it was cover'd over with wax, as that ball of worsted had also been.

To these I will add an observation of my own, which although I should more willingly have related, among other disorders whereto it more peculiarly belongs; if I had made it before I treated of them; yet I did not think proper that it should be omitted in this place, as it relates to the present subject, in the latter part of it at least.

16. A woman, of a middle age, and stature, and of a pretty good habit of body, labour'd under no other disorder, but a catarrh, from the injuries of the cold air, when a fever was added to it; on account of which she was immediately brought into the hospital.

For this fever was acute, and join'd with a great difficulty of breathing, a redness of the cheeks, and a very troublesome sense of weight in the thorax; together with a somewhat hard pulse.

Every thing that was necessary was done; but without any effect. To expectorate was the only thing she desir'd; yet she never could.

At length her pulse became very low, and intermittent; and her respiration so difficult, that she could not lie down in the latter part of her disease. Wherefore she died, on the fifth day from the time she began to be feverish; which was about the middle of March in the year 1748.

The carcase was dissected in the hospital (for the sake of the students) accurately and in order. But I will here first declare to you, what I found pernicious in the thorax and head.

Although the lungs were turgid, and almost every where closely connected to the pleura, that lin'd the ribs; and especially on the left side; yet from the left cavity of the thorax, a serum; which you would very readily have suppos'd to be white from a mixture of pus, if there had been the least token of pus in that part; flow'd out in such a quantity, as the state of the left side of the diaphragm, which was not vaulted, but rather depress'd (when we look'd upon it from the cavity of the belly) had before argued.

Part of that kind of serum was particularly confin'd betwixt the left lobe, and the pleura, where it invested the ribs, pretty near to the middle vertebrae of the thorax; and that for a considerable tract; in which tract, both the lungs, and the pleura, had white concretions adhering to them, like very thick membranes: and in that part only the lobe was found to be grown ewh a hard, and denser than usual.

Yet the patient had not complain'd of any peculiar uneasiness in her back;

nor yet of any pungent pain; although the pleura was, in both sides, of a rosy redness for a considerable space: nor, finally, had she at any time complain'd; for I inquir'd particularly into all these circumstances; of a tremor of the heart, or swoonings, either in the hospital, or at home; notwithstanding I found those appearances in the pericardium, that I am about to describe.

The pericardium was large, and full of a serum, of that kind which was found in the left cavity of the thorax; so that, at first sight, you would have imagin'd it was some large abscess, and not the pericardium, which was open'd.

This serum being exhausted, all the interior surface of the pericardium, and the external of the heart, auricles, and large vessels, appear'd of a pale colour: being all cover'd over with a kind of matter which was of a white colour, inclining to cineritious, and resembling nothing more than lime, just laid upon a wall in the form of a plaister; so that it immediately brought to my mind Guarinoni, who, as I have already told you (*r*), found in this kind of inflammatory disorders of the lungs, and pleura, the heart "cover'd over, as it were, with lime;" that is with polypous concretions (as I there explain'd it, and here again saw it) resembling a thick, but lax membrane, which was very easily taken off, and very easily torn asunder.

And when these sordes were remov'd, all the parts that they had cover'd came into view, and were of their natural colour, and constitution; except that the pericardium was thicken'd, and reddish: that is, not affected with an inflammation indeed, but with a kind of phlogosis nevertheless.

The heart seem'd to be larger than natural; and contain'd black blood, on both sides, such as was met with in several parts of this body: and in the right ventricle, and its annex'd auricle, were round polypous concretions, likewise, contain'd.

The medullary substance of the cerebrum, wherever you cut into it, and the surface of the lateral ventricles also, shew'd small vessels turgid with blood: and in the same ventricles was a serum of a colour inclining to a dirty yellow.

In the belly I had observ'd these things. The spleen was large; the liver very large; so that filling up the left hypochondrium also, as well as the right, it press'd down the stomach: a portion, therefore, of the gula, terminating in the stomach, appear'd at two fingers breadths below the diaphragm. But besides this magnitude no disease was perceiv'd in these viscera.

In the trunk of the inferior vena cava, was an oblong and thick polypous concretion.

At length, in regard to the genitals, the uterus was somewhat nearer to the left side, than to the right; and fell forwards. The ovaries were very long, but very slender, white and hard; and were join'd to the uterus by ligaments that were considerably more thick than usual. The vessels which run through the broad ligaments of the uterus, were very turgid with black blood; and here and there varicous.

When I had carried on the dissection from the upper part of the uterus, to the lower orifice of the vagina, I saw the cavity of the uterine fundus, and the continued cervix, full of mucus; which was almost transparent like a jelly, ting'd with no colour, and thinner than that which is wont to be at the orifice of the uterus, and was not wanting here.

When the upper mucus was taken away, a very small excrescence, almost of the circumference of a circle, and of a red colour inclining to brown, was seen to be slightly prominent from the internal surface of the fundus.

And when the inferior and thicker mucus was taken away, the lowest part of the cervix appear'd to be unequal with a kind of unusual, short, and red lines, lying in a longitudinal direction, and being somewhat prominent.

The vagina; although it was not without rugæ, from the middle of it downwards; was, in proportion to the stature of the woman, who I have said had been of a middle size, longer and wider than is natural; and contain'd, in its cavity, a wooden ring (the proof of a prolapsus) situated in such a manner as I never remember to have seen it before.

For as it was of an elliptical form, it had its longer axis plac'd according to the longitudinal direction of the vagina; and the shorter axis, which however was so long as to distend both sides of the vagina considerably, plac'd according to the breadth of that cavity.

Both of those sides therefore, in that part where they were press'd by the ring, shot forth into an excrescence, of the shape and size of a large deoricated almond; of a cartilaginous hardness, and white, except that one of them was livid in the middle; so that an approaching change, from a scirrhus nature, into that of a cancer, seem'd to have been at hand.

17. Thus far then of the uterus "when prolaps'd outwardly; now, as I have promis'd you (s), of the uterus "when retracted inwardly."

But I do not suppose that you expect, in this great light of anatomy, that I should relapse into the old exploded, and long rejected error; and believe, in concert with old women, that the uterus sometimes ascends to the septum transversum, and even, by permission of the almighty God, to the fauces themselves. Whether some of the ancients, following Galen (t); who was a stranger to this kind of errors; following him, I say, more in words than in reality, have ascrib'd a power of ascension to the uterus; or others deceiv'd, like Fernelius (u), by flatus distending some lax part of the convuls'd intestine, into the form of a globe, have affirm'd that they have, with their own hands, actually found the uterus to be carried up into the stomach; we however understand by the words of Hippocrates, which we still retain, *uterorum introcedentium*, "of the uterus being retracted inwards," not the uterus ascending upwards, but only an irritation from the uterus; under which name I here comprehend the tubes also, and the ovaries; ascending by means of nerves, and membranes, to the superior parts.

And although by the term of *hysterical affection*, we believe that this disorder only, which I have just now mention'd, can with propriety be intended; yet I am not so obstinately refractory to the common custom, as to be willing to dispute with those, who comprise under this same appellation, the various, and

(s) N. 1.

(t) De loc. aff. l. 6. c. 5.

(u) Patholog. l. 6. c. 6.

multiform disorders of women, which often arise from other causes: as I likewise shall not dispute with those persons, who choose rather to call these disorders hypochondriacal; although, very frequently, the hypochondria are no more in fault in patients of either sex, than they call hypochondriacal, than the uterus is in these women whom others call hysterical.

If there be any thing common to both, the chief disorder is in the nervous system as it is call'd: and I think the celebrated Flemming (*) has acted with great propriety, in comprising the disorders of one, and of the other, species, under one general title of *Neuropathia*.

We are not surpriz'd therefore, when attacks of this kind arise suddenly; not from the uterus, nor from the hypochondria; but from terror, or indignation: or even from some peculiar odour. Thus likewise we understand, how we have frequently, and happily prevented, or overcome, these attacks, by the opportune giving of opium.

For, although the origin of these attacks, or paroxysms, might seem to be from the lower belly; and even from the hypochondria themselves, and the uterus; yet the propagation of the noxious motion was, without doubt, made by the nerves and the membranes.

You have already had an example, from me, of a recurrent epilepsy being prevented in its paroxysms, by the use of opium (y). I will now tell you, in a brief manner, how I prevented, by means of the same remedy, these hysterical paroxysms, as they are call'd, in two women.

18. There was a matron of a genteel family, who was afflicted with want, and the absence of her husband; to whom she had born many children in her more flourishing time of life.

This woman was seiz'd with an intermitting fever; the beginning of which became more and more troublesome every day, by reason of the cold increasing. And behold, during this cold fit, she was seiz'd with so great a difficulty of breathing, that she could not perform this function, without her neck being erect; nor without a stertor, and such a constriction of the chest, that, tossing and writhing herself about, in the utmost anguish, she cried out she was just going to die.

The patient herself, and those who were about her, then believ'd, that the cold she felt, as well as the other symptoms, were to be charg'd to the account of the beginning fever.

But as the same symptoms, and indeed more violent ones, often recurr'd at other times, and were even attended with very frequent, and speedy convulsions of the whole body; and moreover with such a constriction at the throat, that, though she felt excruciating anguish, she could not cry out; it appear'd clearly to every one of what nature the complaint was.

It cost me a great deal of time, and a great deal of difficulty, to cure these hysterical paroxysms, first; and after that the febrile paroxysms.

About a year after this, as I remember, when other intermitting fevers, and, after some days, those very violent attacks began to return again; but at the same hour every day; I resolv'd to prevent them from returning if possible. Wherefore, one hour, or somewhat less, before the fit was to come on, I gave her half a grain of purified opium.

(*) In *Neuropathia*.

(y) Epist. 9. n. 7.

She had no attack on that day, none on the two followings days, on which the same remedy was repeated. On the fourth day however; to be faithful and conceal nothing; the disease was more powerful than the remedy: perhaps because nature was accusom'd to it. But as this attack was much shorter than the former, and did not return any more; nor the strength of the patient was so much diminish'd as it had been; I got rid of the fever much sooner, and more easily, than in the preceding year.

19. What led me to say that perhaps nature was accusom'd to this remedy, another example will show. A virgin, of a slender habit, labouring under an obstinate hardness of the liver, and such a number of different, and long-continued, symptoms of disease, that nobody could have believ'd she would live to be of woman's estate; and much less that she would arrive to a decrepid old age; for some little time ago she was still living; was visited almost every day by me, nearly about the same time that I attended the matron I have been speaking of: which was when I was a very young man, and practis'd physic in the place of my nativity.

For to the other disorders, among which I remember that there were much more severe pains of the head, and a greater irregularity in the uterine discharges, than in the matron, a fever was added; which return'd every day at evening, with a coldness. With this coldness, a sense of compression, and tightness, at the chest, and a difficulty of respiration, began to attack the patient.

And this was so much increas'd within a very few days, as to oblige the patient to sit down, distort herself, and throw her arms about, and complain in a miserable manner, when she could; for sometimes it was not in her power to complain.

All remedies were in vain; first to prevent the increase of the attack, and secondly, to prevent its return; till I had recourse to purified opium, by means of which I every day prevented the paroxysm: and, after some days, found that it did not recur, although the opium was omitted.

On the four-and-twentieth day after this, when the attack had return'd again, and I had endeavour'd to overcome it by the same method, but not with the same success; it came into my mind not to change the remedy, but the form of it.

For this reason therefore, having given; at the same distance of time from that in which the fit was expected; as many drops of Sydenham's liquid laudanum, as answer'd to the half-grain of the former solid laudanum, I so far obtain'd my wishes, that I had no more to combat with this paroxysm afterwards as before; but only with the other disorders.

But it was less surprizing that, in this virgin, opium should have put to flight paroxysms which were evidently convulsive, than that, in another hysterical virgin, spoken of by Riverius (z), it should have overcome the same paroxysms, join'd with a very oppressive soporific disorder; and even then in another where the paroxysm made its attacks not only with a soporific disorder, but also with a short continued paralysis of the limbs. For these disorders were remov'd by my friend Guliermi, an ingenious physician, at

Feltri, in the same manner as the others were by Riverius when remedies of a different nature had been of no effect.

However, in the patient of Riverius convulsive symptoms were not wanting; and in the last there was a periodical coldness of the whole body. Which one very symptom, that experienc'd man Berryat (*a*) did not hesitate to consider as a convulsive symptom, in those intermittent fevers; and to look upon it as the cause of these different symptoms, that follow'd in different cases: so that if he could prevent that, he would also prevent these: and this he asserted he had obtain'd, by giving a medicine with opium in it, one hour before the beginning of the cold fit.

And you will perceive, that the four cures of women I have spoken of, which were brought about in the same manner, even before he wrote, agree with his opinion; if you attend to this, that the violent symptoms, in each of them, generally recur'd at a certain hour of the day; either with the cold that preceded the fever, or continued to return every day instead of the fever, as in the last.

20. What has succeeded, with me, in preventing hysterical affections, I have already shewn you. But, on the other hand, by what these paroxysms have been sometimes brought on, according to the observation of Hippolyto Francesco Albertini, and John Jerom Zanichelli, as I have heard it from them, I will not conceal from you.

The first related, that, from the infusion of Sena, he had seen hysterical convulsions arise, more than once: and this you will readily believe might happen, from the vellication of the intestines, and the tormina that were excited in consequence thereof.

The other affirm'd, that he had certainly known Balsam de Copaibe excite violent uterine disorders; which, unless you refer this effect to the smell, that is not very acute, nor very sweet, it will be less easy for you to conceive of.

Here perhaps you will interrupt me, by inquiring whether this has likewise been observ'd in hypochondriacal men? And if not, why then do most persons at this time contend that the hysteric and hypochondriac disorders are one and the same disease?

But softly, I beg of you. For the same things are not always found to be useful or injurious even in hysterical patients: nor do the same symptoms occur in all; any more than they do in hypochondriacal men.

For which reason it should have been less insisted upon; by some in other respects very learned men, who contend for the opposite opinion; that there are so many differences betwixt the two diseases; as if all these circumstances, that they take notice of, were always observ'd in hysterical women, and most of them never in hypochondriacal men; or as if those things which happen much more frequently, and violently, in women, than in men, either were not of the same kind, and different only in degree; or, to those who compare the nervous system of women, their bodies, and method of living, with those of men, it did not plainly appear, why the same causes should act much more easily, frequently, and sharply, upon the nerves of the former, than on those of the latter.

(a) Mem. présentés à l'Acad. R. des Sc. tom. 2.

Nor have I hinted at these things, because I have a mind to enter into an altercation with any person; but rather to prevent others from entering into disputes among themselves.

And indeed if you read over again what I have written above (*b*); you will clearly see what side in this controversy I stand upon: and although I very well know, that, in all women who are call'd hysterical, the uterus, its tubes, or testes, do not betray any disorder to the inquiring anatomist; yet you will see that those women, in whom the irritations begin from these parts, are by us properly call'd hysterical.

Wherefore, if you should say that there was something hysterical, in that widow whom I describ'd in the thirty-fifth letter (*c*), who had been without her menses for eight months already, was not without a sense of something ascending to the throat, and had a purulent pustule in the upper paries of the uterus, and a matter, within the tubes, of a fleshy colour inclining to yellow; in this case, though perhaps I might, I shall not contest it with you.

And I will even add to this, two histories of women, who, as they themselves and others suppos'd it, I will also, agree were hysterical; if you will first give me leave to take notice of as many, that you may add to the Sepulchretum.

One is that of the celebrated Mayerus (*d*), of a woman whose uterus being large; and which is a very extraordinary instance, universally chang'd into bone, so that it was necessary to break it asunder with a hammer, in order to examine its internal substance; contain'd within its cavity, which was very closely shut up at the os internum, a milk-like pus: but somewhat thicker than milk, not foetid, yet, in its center, inclining to a green colour.

This woman, from the time that she began to observe the tumour of her uterus, was free from the hysterical passion; so that you may suspect this passion to have ceas'd, because the uterus could no more be irritated.

The other history is from the celebrated Helwich (*e*), who found four hollow excrescences annex'd to the uterus of a woman externally, as if by a small stalk or stem, of the same texture with the uterus itself; and a sacculus prominent from one of the ovaries: which sacculus, when cut into, discharg'd a gelatinous and blackish matter, to the quantity of half an ounce, with impetus.

This woman, as the same author had declar'd in another place (*f*), was evidently one of those, who, "it is agreed among all physicians," are subject to affections of the uterus; whether, to use the words of Galen (*g*) "any one chooses to call them apnoeas or suffocations, or even a kind of contractions shall happen."

For, being separated from her husband, she had fallen into such a prurigo of the genital parts, as to be but at little distance from a furor uterinus: so as to render it not at all surprizing, that horrible spasms should be brought on; by which the fauces were shut up, and such a difficulty of breathing occa-

(*b*) N. 17.

(*c*) N. 16.

(*d*) *Commerc. Litter. a. 1731. spec. 30. post.*

n. 4.

(*e*) *Eph. n. c. cent. 3. & 4. obs. 142.*

(*f*) *Earund. cent. 1. & 2. obs. 148.*

(*g*) *De loc. aff. l. 6. c. 5.*

sion'd, that there was frequently great danger of a suffocation; by which she was, at length, suddenly carried off; but that the polypi found in the heart of this woman, were rather the effects than the causes of this suffocation, you will naturally believe, if you assent to what I have written to you on this subject, on a former occasion (*b*). But now let us go on to the two observations that I promis'd you just now.

21. A young woman who was a public strumpet, of a fat habit of body, and much given to drinking, having formerly born children; began, after having been without her menstrual evacuations for four months, to be subject to hysterical affections: and after that labour'd even under a mania, and at length died of universal convulsions in this hospital, where I dissected her body, about the end of February, in the year 1717.

The belly contain'd a liver of such a colour as a liver is when boil'd: yet the bile, which had exsuded from the gall-bladder, had ting'd the intestines that lay near it with a very lively saffron-colour.

The testes were white, hard, scirrhus, enlarg'd beyond the natural size, and drawn behind the uterus, by their own weight as it were. The internal surface of the uterine fundus seem'd to be smear'd over with a kind of bloody mucus, just as if the menstrua were about to flow, or had very lately flow'd: besides, on that very surface, a few smallish tubercles, like warts, were prominent.

The urethra, which was perforated with frequent orifices of its canaliculi, being open'd, gave out from some of these orifices, upon gentle pressure, a white and viscid matter; which, if every thing had not been found in this part, might have seem'd to be pus, and given us a suspicion of a virulent gonorrhœa.

The thorax I did not open, as I was taken up with many observations, which it is not necessary to mention here.

The cranium had been saw'd open; but the brain was dissected by some persons who did not think I intended to do it myself; and that when I was absent: which very much disappointed me, as, upon the score of the mania, and the convulsions, I should have inquir'd diligently into the state of this part.

It was, however, related to me, that nothing worthy of remark appear'd, besides polypous concretions in the sanguiferous vessels; which I myself also saw, in those that happen'd to remain.

22. That the liver has been observ'd to be like one that is boil'd in dropical persons, you have in this third book of the Sepulchretum, section the nineteenth (*i*); and, in like manner, in the additamenta to the twenty-third section (*k*): but in cachectical patients only in the twentieth (*l*).

To these add those in whom a cachexy would very soon have appear'd; to which class I think may be refer'd the stonecutter, and the porter: the former of whom I have taken notice of formerly from Jacobus Sylvius, and the latter, as being dissected by me, in the thirty-sixth letter (*m*), and in the

(*b*) Epist. 24.

(*i*) Obf. 3. §. 12. obf. 4. §. 21.

(*k*) Obf. 86.

(*l*) Obf. 2. §. 1.

(*m*) N. 27.

third (*n*). And what this strumpet was threaten'd with, was clearly perceiv'd by the suppression of her menses.

But not to digress far from my purpose; to this related those verrucæ as it were of the uterus, and that state of the testes, which show'd disorders of these parts to have preceded, as you may of yourself conjecture. In the next woman, however, the diseases of the same parts were more manifest.

23. There was a woman, at Venice, of forty years of age, of the lower sort, of ill fame; given to wine, of a proper stature, healthy, and of a fat habit of body.

This woman was subject to fear, even from a slight cause, from which she trembled, and almost swoon'd away. She vomited often, so as to retain nothing of solid food; and could not taste of fish by any means. When we inquir'd, of her acquaintance, in regard to the rest of her disorders in particular, they constantly answer'd that she had never complain'd of her head, nor heart; as for instance, of any violent pulsation, palpitation, or any other disorder thereof; nor had ever, that they knew of, been attack'd with inflammations of the thorax: and why I remark these disorders not to have preceded, you will easily understand, by reading over the account of the dissection.

The only disease of which she complain'd, they said was affections of the uterus, which she asserted to be mov'd, here and there, through her belly, at that time, and sometimes to ascend to her fauces, with a sense of suffocation; from which sense however, she was soon freed.

On the very first day of January in the year 1709, she complain'd about evening that her ribs had fallen in as it were; and order'd an old woman to be sent for, who as the opinion of the common people was, knew how to raise them up again.

Early one morning, when she said that she was seiz'd with a very violent hysterical affection, and that the uterus, moving about here and there, had already ascended to her fauces, so that she was suffocated thereby; she died within an hour, or at most within two: having no foam at her mouth, nor being agitated with any convulsive motions, that any of the by-standers could perceive.

As it was the business of Santorini to dissect the body, and he, for certain reasons, tho' he would have chosen it, could not defer it; he beg'd of me alone; who always avoided dissecting bodies of this kind, till they had lain for a proper length of time; and even press'd me over and over again, by the friendship I had for him, that I would be present at the dissection with him; and beg'd of me with this intent, that we might give the more time to the inquiry, whether the woman was really dead, than to determine the seat of the disorder from whence she died.

The former of these inquiries we made with the greater diligence, as we found the eyes not very turbid, and the body scarcely at all rigid; and, at the tenth hour after death, the thorax even still warm at that time of year.

Wherefore, bearing in mind those things that Galen (*o*) had taken notice of from Heraclides Ponticus, and other ancient physicians; we omitted nothing

which us'd to be done at that time, or since, in inquiries of this kind: that is to say, a little lock of comb'd wool, the flame of a thin wax candle, and a polish'd glass applied to the mouth and nostrils: to place a cup full of water on the *icribiculus cordis* as it is call'd, and to more than one part of the thorax, as if we had divin'd the admonitions of Winslow (*p*): to apply the fingers, and the hand, not only to the region of the heart, but also to the carotid arteries in the neck, and to the iliacs where they descend on the anterior part of the *ossa pubis* to the thighs; the former of which was afterwards confirm'd by the illustrious Senac (*q*), and the latter had been formerly hinted at by Riolanus (*r*); and to apply them repeatedly and attentively, if it were possible to perceive any pulse: at length, by blowing powders high up into the nostrils, such I mean as had a tendency to excite sneezing, upon which Hollerius (*s*) greatly depended in inquiries of this kind.

Not content with all these experiments, and others of the like kind, having perceiv'd, upon making a slight incision into the skin of one thigh, a little blood to come forth, tho' slowly, and continue to flow; we open'd the vein of the cubit with a lancet, in the same manner, as if blood were to be taken away.

And then indeed, a very little blood was discharg'd: but serum separated from the red part was discharg'd also; so that we perceiv'd by this, that a dissolution of the parts of the blood was made in that vein at least.

At this time, however, we were willing to make use of other experiments likewise; which, if the woman should have happen'd to be oppress'd with any kind of pernicious sleep, might act by way of a very powerful stimulus, to awake her.

For we gradually fix'd the point of a very sharp instrument under the nails, after the manner of Fortunatus Fidelis (*t*): but, in particular, we applied a hot iron to the soles of the feet; as Mistichelli (*u*) us'd to do, in order to rouse apoplectic patients.

But all these things being in vain, and that heat which we had perceiv'd about the thorax in the beginning having vanish'd; we determin'd to put an end to our inquiries, as being quite sufficient: nevertheless we cut into the skin, first, leisurely and by degrees; always waiting some considerable space of time, betwixt one and another short and simple incision; after that the adipose membrane, which was very thick, and finally the muscles themselves.

While we were making all these different trials that I have related, we had leisure to observe that the limbs were not lean, nor yet the head; but that they by no means corresponded to the very fat abdomen and thorax: we observ'd besides, that the posterior surface of the body, on which she had lain at the time of her death, was of a red colour inclining to livid; but that the anterior part, neither in the head, nor at the neck, nor in any other place, if you except the upper parts of the thigh, had any redness or livor.

Now I will relate to you what we found in the belly first, and after that in

(*p*) Mem. de l'Acad. R. des Sc. a. 1738.

(*q*) Traité du Coeur l. 3. ch. 7. n. 5.

(*r*) Encheirid. l. 5. c. 46. vers. finem.

(*s*) De morb. intern. l. 1. c. 59.

(*t*) De Relat. Medic. l. 4. c. 1.

(*u*) Apud Lancif. de Subit Mort. l. 2. c. 5.

n. 12. quod postea Mistichellius ipse confirmavit
Tratt. dell' Apopleff. l. 2. f. 1. c. 6. & f. 3.

c. 3. cas. 8. & seq.

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the thorax ; for the head (and perhaps this was not necessary) we had it not in our power to dissect : but I will communicate the appearances, to you, in such order, as to begin with the thorax.

When we had remov'd the integuments of this part, and the muscles, from the bones, and cartilages, that lay beneath, a great disorder appear'd in the latter ; which the very large breasts, and the fat, that lay upon them, so far hid before dissection, that no mark of it appear'd.

That is to say, the sternum being outwardly prominent, at about half-way of its length, rais'd up the adjoining ribs, with it, on both sides : but the ribs which lay next under these, subsided very much : and finally, the last of the ribs ; I mean of those that are join'd with the sternum either by their own cartilages or the intervention of others ; were again prominent, as the natural structure of the chest requires : wherefore, at each side of the sternum were large depressions of the ribs, which the breasts, and the fat, made to appear equal and smooth on the outside ; as I have already said.

Upon opening the thorax, the left lobe of the lungs was found to adhere to the pleura in one part, though very slightly : and the right lobe was found to adhere very closely thereto, in almost every part, by a kind of membrane which was form'd preternaturally, upon the external coat of the lungs.

Both the lobes, when we cut into them, we found to be hard, and tendinous, as it were, in many places ; and abounding with a frothy humour besides, as if with a kind of saliva.

The pericardium contain'd a considerable quantity of water, of a brown colour, and inclining to be turbid. And both sides of the heart contain'd a black fluid blood, such as was found almost every where in this body : the right ventricle, moreover, contain'd a small polypous concretion, of a white colour, but soft ; a similar one to which was found in the pulmonary artery, with a great quantity of blood.

With this fluid the right auricle was very turgid ; but the left was contracted. However, the ventricle annex'd to this auricle, being larger than its natural size, offer'd to us more than one circumstance worthy of observation.

For, to omit that the tendinous fibrillæ, which pass betwixt the valvulæ mitrales, and the columnæ, seem'd to be in greater number than usual ; these columns were certainly thicker than they naturally are, and more hard : so that they seem'd to be much more of a tendinous than of a fleshy nature ; whether you consider'd the colour, which was white, or attended to the resistance they gave to the knife, in incision.

Besides, in the parietes of the same ventricle, some places occur'd, here and there, in which the fleshy substance of the heart was either white, or of a red colour inclining to whiteness ; so as at first to impose upon us under the appearance, as it were, of glands : but it shew'd itself to be similar to the columnæ, by that same peculiar resistance when cut into.

This disease, of the fleshy fibres of the heart degenerating into a tendinous nature, became the more evident, the more it went from the internal surface of the ventricle, to the external surface, and it also reach'd, externally, to that place with which the septum cordis corresponds.

And indeed the fat itself which lay upon this viscus, was not quite in a natural

tural state. For on the posterior surface of the heart, it was unequal, for two small tracts, in a longitudinal direction; and in the same place was of a brown colour inclining to red.

The large artery, from the heart almost quite to the whole of the curvature, was very evidently dilated, though not in any great degree; and near to the septum transversum it seem'd to be narrower than it naturally is.

Having laid it open; and discharg'd the blood, which it contain'd in some considerable quantity; it shew'd, on the whole of its internal surface, from the heart at least to the emulgent branches, some whitish particles, and some lines that were a little protuberant: besides, not only in that tract which I just now spoke of, but in other parts also, as I found from dissecting some of its superior branches, the internal coat of this vessel was so easily to be disjoin'd from the next, that large pieces of it follow'd the slightest friction of the scalpel.

In the belly were the following appearances. The omentum was drawn up towards the spleen. The situations of the intestines were disturb'd. And these viscera, but particularly the colon and the rectum, were much distended with air. The mesentery indeed, the stomach, the spleen, and the liver, the bladder annex'd to which was full of bile, were sound.

But the pancreas, which, like some of the small intestines, was of a red colour; especially in its more descending part; had its glandular bodies firmer than they generally are, and more distinct from one another.

Finally, in examining the uterus, the tubes, and a considerable part of the vagina, with accuracy; not only at that time, but on the day following, when they were taken out of the body, in order to give us more time, and day-light; we observ'd these things.

To the posterior part of the fundus uteri, externally, about the middle, was hanging, by a short peduncle, a globular body, resembling nothing more in whiteness, form, and magnitude, than a small unripe cherry: in cutting of which, we found it made up of a fibrous, but callous substance; the orders of the fibres being confus'd: another globe of this kind was buried within the very thickness of the parietes uteri.

The fundus uteri being open'd soon after, it appear'd to be smear'd over with a great quantity of mucus which was somewhat bloody: which being wip'd off, and I having shown, by pressing my fingers underneath, that bloody drops came out every where from the fundus, but not from the cervix, and still less from the vagina, with a very gentle pressure; it did not so much displease Santorini, that we could not learn, for a certainty, whether the woman had menstruated lately, as that he had before suppos'd (x) the source of this discharge to be in the vagina, rather than in the uterus.

The upper part of the cervix excepted, the remainder was ting'd with a far different redness; that is to say, as if from inflammation, which on one side inclin'd more to a brown, and yet did not any where pervade the substance of the cervix to any depth.

In the tubes also was a mucous humour, but white. Both of these canals

(x) Opusc. Medic. 4. n. 3.

were pervious into the uterus, for air blown in by the larger orifice: nor were hydatids wanting near to that orifice.

Both of the testes were tumid from included cells: but one of them more than the other; as besides one large cell, it also contain'd many smaller ones, all full of serum, except one which was fill'd with a white pus.

In the other, together with the cells, and the vesicles, containing serum, we saw other cells of a black colour internally. And on the surface of both we observ'd orifices, which admitted a slender probe: but particularly in the membranes by which the tubes are connected with the testes; they are call'd *Alæ Vespertilionum*, or bats wings; we saw the plexusses, and nerves running in an elegant manner.

And as these were some of the thicker ones which I had seen before; see, said I, this is the "plexus," and these the "nerves," which I have spoken of in the *Adversaria* (y), and promis'd to describe more fully on some other occasion: this description was afterwards given by Santorini (z) himself, but he must have totally forgotten this passage of mine in the *Adversaria*, when he said, that this plexus was either not clearly "known, or indeed not hitherto observ'd."

24. I am not willing to add long annotations to a long history. Let it be sufficient to subjoin a few things, and these in a brief manner.

In regard to the sternum, therefore, being prominent in a certain place, and the ribs, together with their cartilages, being depress'd inwards to such a degree, on both sides, where they sustain'd large breasts, and a thick fat; a passage of Riolanus (a) is extant, which refers to the same thing: "in women that have large breasts, and are fat, I found, upon removing the bulk of the breast, the sternum acuminate, and the chest narrow; which in them was the cause of a dyspnœa: this narrowness had been caus'd by the weight of the breasts."

This last circumstance is a doubt with me. For unless women lie, the greater part of their time, in a supine posture; which is not so convenient to those who are fat, and have large breasts; the weight of the breasts rather draws the ribs outwards, than forces them inwards.

Neither can you impute it to the hard, and tight stays, which women wear; for how can they hurt the ribs, without hurting the breasts? Wherefore, I should rather choose to account for this vitiated structure, from the original formation: for it does not appear in those who are fat, and have full breasts, but by dissection, wherein it strikes the eye, and the attention, of the anatomist, much more than in lean persons, (in whom if it be at all, it is obvious before dissection) as it is an appearance which he does not expect.

But be this from what cause it will, there is no doubt, but, by straitening a part of the lungs, it may render the circulation of the blood through them, so much the less easy, and respiration less free; especially where from convulsion, or any other cause, either of these offices is made more difficult.

And although it is very difficult in very fat and full-breasted women of that kind, to distinguish this disorder; unless, perhaps, by pressing your fingers,

(y) I. n. 14. in fine.

(z) *Encheirid. Anatom.* l. 6. c. 14.

(z) *Obs. Anat.* c. 11. §. 17.

very strongly, against the chest, at the sides of the breasts; yet if they are affected with a much more difficult respiration, than others of the same make, without any apparent cause; you may then suspect whether such a diseas'd structure is not the cause, in consequence of my observation, and those of Riolanus.

And to these you may readily add an example, taken from the *Commercium Litterarium* (*b*), of a noble woman afflicted with an asthma; among the causes of which, you will see that a male conformation of the chest is, with justice, recounted: for "the ribs, of the left side, being curv'd like the "Greek letter sigma," made the cavity of the thorax narrow in a surprizing manner; and depress'd the heart, which was longer than the heart of an ox, into the right side.

But as this woman "was very fat, and fleshy," it is most probable that this disorder, of the ribs, had lain hid under a great quantity of fat.

25. But, in regard to that sensation of the ribs falling down, as it were, to raise up which the old women often send for their she-physicians, especially in some particular cities; as I remember formerly to have seen in mine; I confess I have nothing certain to say upon the subject.

Yet I nevertheless suspect, that some injuries, and uneasinesses, of that kind which the cartilago xiphoides is wont to occasion, when verging inwards, are confounded with this sense: of which injuries, after Codronchius (*c*), and Septalius (*d*), you may see what is transfer'd into the Sepulchretum from Diemberbroeck (*e*), from Barbette (*f*), and Bonetus himself (*g*): although that even the cartilages of some of the spurious ribs, may now and then be depress'd, and bring on considerable inconveniences, which are, nevertheless, immediately remov'd by restoring them to their former seat, and that by the hands of an old woman, you will learn from the same Sepulchretum (*h*).

But whether these cartilages belong'd to those "two last" ribs, or to the "last of all;" and not rather to some one of them, that are next above the two last, the well-known shortness of those lower cartilages makes me doubt: and still more, when I read that the "lower of them lay upon the "upper."

However, in the woman in question, whether the sense, whereof we speak, belong'd to some cause of this kind; or to another which I have explain'd to you in the case of a woman formerly spoken of (*i*); it is better to leave quite undetermin'd, than to make any unadvis'd conclusion in this place.

26. But as to what relates to the fleshy substance, of the heart, degenerating into a tendinous nature, you will, in the first place, conceive from thence, that it was not without propriety I formerly (*k*) suppos'd this might happen; I mean when I was upon the subject of explaining, in what manner this substance is sometimes chang'd into that of bone.

(*b*) A. 1733. hebdom. 37. n. 2.

(*c*) De Prolapsu Mucron. Cartilag.

(*d*) De Morbis ex Mucron. Cartilag.

(*e*) Sepulchr. l. 2. f. 1. in additam. obs. 11.

(*f*) Ibid. l. 3. f. 7. in Schol. ad obs. 19.

(*g*) In eod. Schol.

(*h*) L. 2. f. 1. in Schol. ad obs. 116.

(*i*) Epist. 26. n. 25.

(*k*) Epist. 27. n. 17.

And that the force of the heart decreases so much the more, in proportion as the greater number of its parts become tendinous, instead of being fleshy; it is natural to gather even from those things, which are said in the same place (*l*).

Moreover, this force had decreas'd, in that ventricle which has need of the greatest force, that is in the left; which, like the nearest part of the great arterial trunk, had another disorder of dilatation.

Yet the woman had not complain'd of any violent pulsation of the heart; for Albertini (*m*), even in aneurismatic disorders, found the pulsation, "either quite inconsiderable, or much less than usual, where the substance of the heart had become, quite from its basis to more than one half its extent, either tendinous, as it were, in its consistence and colour, or too flaccid in its nature;" for there is no doubt, but the natural force of the heart must be debilitated, from either of these states.

However, in regard to all these disorders, and others, which I have describ'd in the great artery, and the substance of the lungs being become tendinous, as it were, in many places, and the coarctation of these viscera, and of the heart, by the depression of the ribs; in regard to all these disorders, I say, you very clearly see, that they might produce a fatal interception, both of respiration, and of the blood's circulation; where a more violent convulsion, than usual, of the nerves that go to these parts has come on.

27. That this convulsion had; as well as other more slight disorders, to which the woman had been subject; its origin from the uterus, and testes; the preternatural appearances which we saw both in the former, and the latter, and the sense of the uterus ascending, as it were, which began from thence, seem to argue.

For, although we did not find the uterus to have proceeded upwards, from its natural situation; which indeed cannot happen; yet we saw the intestines, which might be taken for the uterus, not only distended with flatus, but also remov'd from their natural situations. And to these parts a convulsion is easily propagated, by the nerves communicating with those, that, being subservient to the functions of the tubes, and the testes, were seen by us in the *alæ vesperitilionum* in a thick state; inasmuch as they are frequently disturb'd by irritations arising from the testes.

Here you will perhaps say: but much more considerable diseases, both of the uterus, and testes, are frequently found in other women; who had not, nevertheless, been afflicted with violent affections of this kind.

I grant it. Yet there is not in all a matter equally acrid, and irritating; nor are the nerves equally prone to receive an irritation in all, as they were in this woman, who trembled from the slightest occasion of fear: nor, finally, are there in all, as in this woman, those disorders of particular viscera; so that if a violent convulsion make an impetus upon them, they have it not in their power to resist.

For which reason, we have the more to fear for those hysterical, or hypochondriac persons, in whom we either know, or may with good reason

suspect, that there is either a very great acrimony of the humours, or a taint of the principal viscera, at the same time.

And as some physicians, otherwise not unlearned, did not attend sufficiently to this; I remember that a young man, who was hypochondriac, and who had been accusom'd, for a long time, to harass their ears with excessive, and continual complaints; though for the most part to very little purpose; being seiz'd with a fever, which they, as usual, paid but little regard to, and made light of, was overcome by the insidious disease, and carried off, before they, I do not say foretold, but were sensible of the danger.

You therefore, even in querulous persons of this kind, will preserve, according to your custom, a cautious, and accurate diligence. For diligence was never injurious, but negligence often is: and to this, if I may say the truth, it is to be imputed, for the most part, that "any person dies, of whom the physician was secure (n)." Farewell.

(n) Cels. de Medic. 1. 2. c. 6.

LETTER the FORTY-SIXTH

Treats of the Impediments to Venery, and of Sterility in both Sexes.

ALTHOUGH that section of the Sepulchretum, which immediately succeeds, I mean the thirty-fourth, comprises not only what relates to sterility, but also what relates to salacity; yet it is my intention to imitate Bonetus in the former only, for in the latter I have nothing at hand to produce: and indeed I think that some things produc'd by him might have been better omitted.

For what does it contribute to salacity, that the right spermatic vein, and the left, both open'd into the emulgents (a)? or at least that there were more than two (b)? Especially as a less aptitude to venery is afterwards accounted for, from their number being increas'd (c); and the generation of a cold, and watery semen, is deduc'd from the influx of these veins into the emulgents (d).

(a) Obs. 1. §. 1. & 3.

(b) Ibid. §. 8.

(c) In Schol. ibid.

(d) Obs. 5. §. 3.

So, in like manner, what has the increas'd size of the kidneys to do therewith (*e*)? Or the diminish'd size on the other hand (*f*)?

It is true, I am not ignorant what was formerly said of the office of these veins; and what has been contended for, in regard to the kidneys, even by Bartholin himself (*g*). But as the former things have been already set aside, by the knowledge of the blood's circulation; and as what relates to the kidneys is expressly call'd "a paradox" by Bonetus (*h*); they should rather have been hinted at in some of the Scholia, than recited among solid observations.

But I, moreover, think that in regard to sterility, or fœcundity, some things might have been left out with very great propriety. I will give you two instances.

A man who had forc'd a virgin, was entirely destitute of testes, both internally and externally (*i*); the testes therefore do not serve for the generation of the seed.

Formerly, indeed, there might have been room for these things, when that very opinion of Aristotle, for instance, which is there quoted, was embrac'd even by learned sectaries: among these I do not doubt to place Catullus, whom the succeeding poets have with justice, call'd "learned," when he writes thus of Atys (*k*).

Devolvit illa acuta sibi pondera filice.

"He disencumbers himself of these weights by means of a sharp flint."

And now what has this comparison, of testicles with weights, to do with the present subject? Or what has this assertion to do, "that none of the spermatic vessels any where enter the testes?"

Or, finally, what affinity is there betwixt a virgin being forc'd, which may be done by an eunuch, and impregnation, of which an eunuch is certainly not capable?

It is also worth while to pay attention to this circumstance, that, in a woman (*l*), who "died from the excessive use of venery, the round ligaments, "in the part of them nearest to the uterus, were found full of semen."

There is no doubt but these things might have met with approbation formerly; but they cannot meet with it now: no more than those things that are advanc'd in the preceding section (*m*), of the female semen being found corrupted in the tubes, or in the uterus, and *vasa deferentia*.

But give me leave now to omit these things, and produce those that are more probable, in regard to the sterility of both sexes, and first from Valsalva.

2. There was a certain man who was dumb, yet not because he was deficient in his hearing; for he heard very well: the same person had no hairs, either on his face, or his breast, under his arm-pits, or on the scrotum; a

(*e*) Obf. 1. §. 5 & 6.

(*f*) Obf. 2. §. 1.

(*g*) Vid. Advers. Anat. 3. animad. 33. ad fin.

(*h*) Schol. ad obf. 1. §. 5.

(*i*) Obf. 1. §. 2. & Schol.

(*k*) Carm. 62. v. 5.

(*l*) Obf. 6. §. 6.

(*m*) Obf. 4. §. 11 & 12.

few scatter'd ones being seen on the pubes only, at the very root of the penis. This man was carried off by an accute fever, at the age of five and thirty, his fever being attended with worms.

All the organs of generation being accurately examin'd, they shew'd no mark of diseale.

3. Whether this man had a generative faculty, or not, Valsalva has not added; nor yet whether he was without hairs quite from his birth: for the celebrated Heister (*n*) saw a man, who, without any foregoing disorder that deserv'd notice, had lost all the hairs in his body, and did not recover them within ten years.

Yet it is to be suppos'd, that he, of whom Valsalva left this account, was not only naturally without hairs, but incapable of procreation; so that both the circumstances led him to undertake an accurate examination of all the parts of generation.

And as there appear'd to be no disorder in those parts; this observation seems to hint, that the cause, whatever it is, by which the semen is render'd fertile, and the body becomes hairy, must exist in the invisible structure of the parts which secrete, or perfect, the semen.

And we, certainly, see both of these circumstances happen together, at the time of puberty, that is when these internal structures have now begun to be sufficiently develop'd.

And indeed, some very slight appearance, in the cutis of women, has sometimes been a proof to me of their sterility; when this was from the birth, and perpetual. For I have seen that two women, in whom there was nothing at all that did not promise fecundity, have been married to men of excellent health, and yet been barren.

When I consider'd every thing very attentively; I found the cutis, in one, contrary to what we should have suppos'd, from her kind of life, age, and habit of body, to be by no means smooth, and soft, if you touch'd it: and in the other I found the skin cover'd with a cuticle, which was continually coming off in little scales, and scurf, even in the face. And I saw a third barren woman similar to the last when I was copying this letter.

And to me these things seem'd to admit of being accounted for, from the sebaceous glands of the skin secreting a matter, which is either less in quantity than it ought to be, or not of the nature requir'd.

But how this matter, when retain'd within the body, or being less fit for its office, should prevent conception, is uncertain. At present, however, let us come to evident disorders, in the organs of generation themselves.

4. Valsalva made observations upon two women who were barren; though in the prime of their life; the one from having scarcely any vesicles in the ovaries; and the other from the humour of these parts being quite concreted; just as if they had been boil'd upon the fire. But as I have given you the history of these, already, in other places (*o*), there is no need to repeat them here. I go on therefore to my own.

5. I dissected most of the parts of a man, who died in this hospital, about the latter end of November in the year 1717, with a view to anatomical

(*n*) Eph. n. c. cent. 1 & 2. obs. 197.

(*o*) Epist. 36. n. 17. & Epist. 20. n. 7.

inquiries; when I observ'd that some parts were in a preternatural state.

The ureters were wider than natural in some places. And on one side, both the vesicula seminalis, and that part of the vas deferens, which is next to this vesicle, had scirrhus parietes; the membranous substance being almost chang'd into a cartilaginous nature.

6. From this observation it appears, how much was wanting for the perfection and ejaculation of the semen. For neither that which is wont to be added, by means of Harderus's glands, or carried away by the lymphæducts, could be here added, or carried away; nor could the force, which the contracting coats of the vesicles, and of the lower parts of the vasa deferentia, previously distended with semen, exert on this fluid, where it is thrown out, be at all expected here.

But on the other side, you will say, nothing of this kind was wanting.

Yet the quantity of inert, and watery semen, as it were, which must flow from the opposite side, was of great detriment to that very good semen to which it was join'd.

And indeed the hardness, and thickness, of the seminal duct, at its termination on one side, may increase so gradually, as to press upon the extremity of the other, and obstruct it.

And thus it was I remember, that I answer'd to Laurence Mariani, a gentleman whom I have spoken of before, when in the close of the year 1736, he wrote me the case of a noble youth.

This young gentleman having never had knowledge of any woman, his wife only excepted; by whom he had one daughter; had a swelling of the left spermatic vessels, attended with pain, together with a swelling of the epididymis, and the vas deferens; which was perceiv'd to be hard, together with the epididymis; while the testicle preserv'd its usual softness.

By means of some remedies, which were applied, the pain was, after some months, greatly diminish'd; but the tumour and hardness not greatly.

Notwithstanding every thing on the right side was, as far as we could judge, in a sound state; and therefore very proper for the generation, and conveyance of the semen; the patient, nevertheless, emitted none of this fluid in coitû, to the great surprize of the physicians.

However, you will have observations of a coalition of one of the vessels, that carries down the semen to the vesicle, and in like manner of a calculus concreted in one of the vesicles, to add to the others; of the former case from Brunnerus (p) and Waltherus (q); but of the latter from Valentinus (r).

7. And I might here add what I have remark'd, in the dissection of bodies, of the seminal vesicles being dry, and wrinkled, even in a young man; and of the passage of the semen, into the urethra, being become blind; which Waltherus (s) also saw; if I had not already communicated these things to you, when treating of other disorders, and particularly of the virulent gonorrhœa (t). And for the same reason I omit what relates to calculi.

(p) De Gland. Duod. ubi de ear. in Hom. Demonstr.

(q) Act. Erud. Lips. a. 1725. M. Novembr.

(r) Eph. n. c. dec. 2. a. 6. obs. 68.

(s) Loco modo indic.

(t) Epist. 44. n. 7. & Epist. 49. n. 29.

of the prostate gland, that prevent the exit of the semen. For this you have already had in the forty-second letter (*u*).

8. I should also have written at large, in this place, of the great disorder of the urethra, which I examin'd in a rustic young man, together with my celebrated colleague Vallisneri; if he himself had not publish'd the case three years after (*x*), and the editors of all his works over again (*y*). Wherefore I shall only add some few things.

As the scrotum was not entirely divided into two parts; but only anteriorly; betwixt the upper parts of both these divisions was the orifice of the canal of the urethra: and from thence quite to the apex of the glans, through the whole inferior surface of the penis, which was much shorter than is represented in the figure (*z*), not a canal, but a semicanal, was now continued; that is the upper paries of the urethra only and this smooth and shining; so that you would find somewhat less difficulty in giving credit to the young man, and to a woman, who said that she had been with child by him: for the former asserted that when he made water with the penis a little rais'd, the urine ran out through the semicanal; and the latter that the semen, ejaculated by him, enter'd the vagina, and was not lost.

At least the urine, when he discharg'd it against the wall, we saw to ascend higher than the orifice of the urethra. Nor did it escape us what the structure of the penis can bear; and what de Graaf (*a*), and Harvey, whom he quotes, had seen on this account; I mean that a penis "which appear'd very small, at first sight," when it was inflated, "had stretch'd itself out into a large body, from being almost hid: and that sometimes, "except when it was excited by a tentigo, it had not been at all prominent in the "corrugated scrotum, except in the extreme apex of the glans."

We therefore conceiv'd, that when this small indeed, but not very small, penis extended itself; the young man at the same time affirming it; that part thereof in which the orifice of the urethra was seen, was stretch'd in its length, and by this means sufficiently enter'd the vagina; and that, by the inferior paries of this cavity, applying itself to the remaining part of the open urethra, the semicanal was chang'd into a perfect canal: just as happens to the semicanals which I have describ'd in the *Adversaria* (*b*), in the penis of the tortoise, and the viper, when receiv'd in the genitals of their females.

Indeed I do not know, whether, in the infant of three months old, who Palsin (*c*) has told us was seen by him, as the canal of the urethra terminated in the same part that it did in our young man, so a semicanal was continued quite on to the glans: but this I know, that if the conformation of that child was the same as the conformation of this young man, the prediction that this diseas'd structure "would render him incapable of procreation, and "cause great inconvenience in the discharge of his urine, is but little to be depended upon."

Yet I am not ignorant, that the ancient physicians, and surgeons, even in those men, in whom the canal of the urethra is produc'd quite to the glans,

(*u*) N. 37.

(*x*) Eph. m. c. centi. 9. obs. 72.

(*y*) Tom. 3. p. 3. n. 28.

(*z*) Cent. cir. tab. 2. fig. 1.

(*a*) De Viror. Organ. ubi de Nervof. Penis Corporib.

(*b*) IV. Animad. 4.

(*c*) Anat. du Corps hum. p. 1. tr. 2. ch. 17.

but opens beneath it; who are for that reason call'd *hypospadiæi*; have pronounc'd the same thing, in regard to the faculty of generation: and this opinion is confirm'd by the more modern authors, and particularly by Dionis (*d*), where he points out some causes of this disorder, even after birth.

But I wonder nevertheless, that, as they have read our Fabricius; which appears from their writings; they have made no exceptions to such a predication; but have asserted that the work of a surgeon is quite necessary here; as he has expressly admonish'd us (*e*), "that he had nevertheless seen children, " which had been begotten" by those, who were affected with this disorder; which others (*f*) also have confirm'd.

Wherefore, I the more commend Ruysch, who; having formerly suppos'd (*g*) that a disorder, not unlike that, for instance, which I have describ'd, "brought on an incapacity of procreation;" has so moderated his assertion afterwards (*h*), as to say, "that those who labour under this disorder rarely "impregnate their wives."

But to return to those in whom the urethra happens to be open in a great part of it, and form'd into a long femicanal; in the year 1756, before I revis'd this letter, another rustic young man, of two and twenty years of age, was brought to me, who had the same kind of formation as the other; except that the femicanal, at its beginning, was a little distant from the upper part of the scrotum, which was cover'd with hairs, and had a considerable division into two parts.

In this young man, also, the urine did not fall down at his feet, but was thrown against the wall: and the penis, when distended by a tentigo, became from a short one, considerably longer; as he himself affirm'd.

And as this was consonant to reason, so the appearances; and in particular the length of the femicanal, which was but little less; render'd it not at all improbable, that this young man had, likewise, impregnated a woman; as both of them confess'd.

Those who saw, at Petersburg; many years after the publication of Vallisneri's observation and mine (*i*); the urethra lying open after the manner of a sulcus, or femicanal; being solicitous about determining the sex (which was an inquiry we had not the least occasion to make) did not once inquire, whether this structure could intirely take away the power of procreation.

And the celebrated Abraham Kaau Boerhaave, when he produc'd their observations, stood up for our opinion; which he seems not to have seen: for which you will also suppose the celebrated Haller (*k*) to argue, where he speaks of it in a cursory manner; and suppose that he would have argued for it in a boy also; in whom he saw a like deformity; if he had seen him in an advanc'd age: for the boy was no more than three years of age, at the time he examin'd him.

I do not refer to this class the observation of Salzmann (*l*), on a rustic young man, whose urethra pass'd not below, but above and betwixt the nervous

(*d*) Cours d'Operat. de Chir. Demonstr. 3.

(*e*) De Chir. Operat. ubi de glande non perfor.

(*f*) Eph. n. c. dec. 1. a. 3. obs. 91.

(*g*) Mus. Anat. thes. c. Repos. 1. n. i.

(*h*) Thes. Anat. 8. n. 30.

(*i*) Nov. Comment. Acad. Sc. Imp. Petropol. tom. 1. in Physic.

(*k*) Comment. Soc. R. Sc. Gotting. tom. 1.

(*l*) Act. n. c. tom. 4. obs. 65.

and spongy bodies, in an open state, on the back of the penis; because here, as the figures show (*m*), the penis was so much the shorter in proportion to its thickness, nor increas'd much from venereal ideas; and also because it was a little curv'd downwards; and last of all because the urine did not flow out with impetus through the urethra. On account of all which circumstances, it was with justice suppos'd, that the young man was not fit for the propagation of his species.

9. And I judg'd in the same manner of another young man, who was thirty years of age, although he neither had the urethra on the back of the penis, nor the whole of it open. This man I carefully examin'd, as I was requested to do, and as the case itself requir'd, in the year 1738.

He was less robust than the other two, that I inspect'd; yet was pretty healthy and well, except his eyes and his penis; the former of which were blind from an old and constant inflammation, and the latter was in the state I shall presently describe.

He himself readily acknowledg'd, that his wife was in the same state of virginity, in which he had married her three years before. He suppos'd the cause to be, that the glans was curv'd towards the inferior part, and not perforated at the apex, but below; and for that reason obstructing both the entrance of the penis, and the ejaculation of the semen.

After hearing these things, I examin'd the genital parts, and found them in the following state. The testes were large: the scrotum was not pale indeed, but very lax: the penis was of a proper proportion, both in length, and thickness: the preputium was of the same kind that I have describ'd in the two other young men, similar to the præputium clitoridis: for it sufficiently cover'd the upper surface and sides of the glans; but was deficient on the inferior surface.

And on the whole of the same surface of the glans, and for a little space below the glans, the inferior paries of the urethra was also wanting; so that, like a semicanal, only the upper paries continued to the extremity of the glans; being smooth and of a slightly red colour, and in the middle, in a longitudinal direction, showing very clearly three orifices of the larger canals, which I have spoken of in the *Adversaria* (*n*); being in the form of an ellipse; orifices of which kind, and more indeed, and those somewhat larger, we had seen in the first young man in particular; whereas in none of these did any small foramina of the lesser canals appear, though sought after with attention: for I do not doubt but the figure, which I have refer'd to above (*o*), was describ'd from memory; as, besides orifices that pass in one right line through the middle, it represents so many other foramina, here and there, at the sides.

Moreover, the orifice of the canal of the urethra, in this young man of whom I have begun to speak, was in that part, from whence I have said that the semicanal began: and a very little below that, the inferior paries of the urethra was perforated with another lesser orifice: and the young man said that urine came from both of them; and that he had heard from his mother, that he was born with this conformation.

Then inquiring into the cause of curvature in the glands, when I saw that the skin was pretty lax, which adher'd to that part near to the orifices whereof I have spoken; and not tense and contracted so as to curve the glans; I inquir'd whether, when the penis was turgid, the glans was turgid also; and whether, at that time at least, any troublesome sense of tension was perceiv'd; and particularly at the place of the skin's adhesion just now pointed out. To both of which he answer'd in the negative.

He only added this, that in his early puberty, when the penis was tumid, this troublesome sense had been perceiv'd in that part; but after a few years having pass'd was perceiv'd no more: and although, when he married his wife, the glans sometimes swell'd together with the penis, yet from the time, that, in making vain endeavours to enter the vagina, a great quantity of semen had been pour'd out with great quickness; from whence he said that his ophthalmia became more slight, and his sight less dull; the penis only became tumid, and the glans hung down flaccid, and without any voluptuous inclination.

It was evident that what he could not perform with a tumid glans, it was impossible for him to do with it flaccid. And the reason why it had formerly been flaccid in general, and was always so now, I suppos'd to be that male conformation of the urethra, which I have now describ'd.

For, as the inferior paries of this canal was wanting in that part, where it is wont to be increas'd by a pretty thick corpus spongiosum dilating itself to make up a considerable part of the exteriors of the glans; it is to be suppos'd that the blood, which is protruded upwards for the proper distention of the glans, must have had a less quick passage thither: and this conjecture was confirm'd to me, by the same spongy body of the urethra; as from those two orifices, quite to the root of the penis, I observ'd it to be thicker than usual in this young man; without doubt from the blood not having a free passage into the glans, and therefore being collected below it: so that, in proportion as it added thickness to this spongy body, so much did it detract from the length, and by this means curve the adjoining glans downwards.

But none of these circumstances took place, in the other young men whom I examin'd; because that body extended its inferior paries, not at all, or but just above the scrotum; and the superior paries, or that which is receiv'd betwixt the nerveo-spongyous bodies of the penis, was certainly very thick, as happens in some persons, so that it could sufficiently communicate with the glans.

You will perceive this, in some measure, from the figure given by Ruysch, which, in his century of observations, is mark'd seventy-six: and those things that I conjectur'd in the young man last describ'd, you will conceive of far more clearly, from the eighty-first, and eighty-second figures, of the same century, when compar'd with the seventy-fifth.

10. By the several things which have been just now said, you see that what the more modern physicians, and Boerhaave, in particular (*p*), have taught very clearly; from considering the structure of the penis with great accuracy; are confirm'd: I mean that the corpus spongiosum urethræ, and the glans,

may be tense and tumid, while the corpora penis remain flaccid, or are even absent; for so our Plazzonus (*g*) saw it; and on the contrary it may happen, that the glans may remain flaccid, while these bodies of the penis are distended: for in either the one or the other way, the business of generation may be injur'd.

Moreover, there are many and various impediments to distention; just as there are many and various causes of this distention. Among which causes, not only the real, but the apparent, plenitude of the vesiculæ feminales, seems proper to be plac'd.

I call it apparent at that time, since there is not so much semen in the vesicles, as they can really contain at another time; but as much as they can contain at that time.

Thus, upon waking in a morning, even some old men are sensible of a tention, which they immediately get rid of by discharging their urine. For the urine distended the bladder, and this compress'd the subjected vesicles; but particularly by that basis of it which extuberates on the back-part, and which I have spoken of; so that, by this means, their capacity being diminish'd, they were just as much distended, even with a small quantity of semen, as they would have been with a great quantity when not compress'd.

And indeed the most experienc'd physicians, and among these Gulielmus Ballonius (*r*), have taken a very useful hint from this phenomenon. Let him who is not very potent in his generative faculties, says he, "perform copulation after much titillation, with his urine retain'd, and having a great desire to discharge it."

So what the same persons have observ'd after Galen (*s*); that among the marks of a stone in the bladder, the penis sometimes "is immoderately tense;" we shall account for in the same way: and especially where there is a very large calculus.

And I have said in the same way, without being ignorant that these phenomena may be explain'd in other ways also. Yet there are cases in which one explication may be preferable to another: and, indeed, it may even sometimes happen, that many causes, of the same kind, may conspire to produce the same effect.

II. But of men I have spoken sufficiently. Now let us pass on to women; beginning with two, whose genital parts I was requested to examine with accuracy, in the same manner as those of the three young men mention'd above.

One was a rustic woman, whose pudendum was in a perfect and natural state. But that *canal*, as they call'd it in the time of Celsus (*t*), into which it opens, and which we now call the vagina, had scarcely run on more than a third part of its proper length, when it suddenly terminated in that part.

There was no cicatrix at that place, nor below it: the woman herself, or her parents, could none of them call to mind any ulcer, or any other preceding disorder, in consequence of which the sides of the vagina might have coalesc'd; for if these parts are ulcerated, either from the lues venerea, from a difficult birth, or from any other cause whatever, where the carelessness of the sur-

(*g*) De Partib. Generat. l. 1. c. 21.

(*r*) L. 2. Consil. Med. 26.

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(*s*) De loc. aff. l. 1. c. 1.

(*t*) De Medic. l. 4. c. 1. ad fin.

geon, or the midwife has co-operated with the disorder, how easily the sides of this canal may grow together we are taught by many examples; some of which will be pointed out to you by Marcellus Donatus (*u*): and others I shall take notice of below.

However, not only nothing of that kind had preceded in this woman; but every part moreover; being smooth, shining and equal, when you had open'd, and dilated, that part of the vagina which there was; appear'd in such a manner, that you might plainly perceive not only the sides of this canal to be in their original state; but that the part by which they were bounded, was a kind of roof, or ceiling, form'd by the first institution of nature; being of the same structure, and made up of the same substance. Nor indeed did this roof or ceiling in the least give way, either to the finger when press'd against it, or to the penis of the husband; which had now, for three years space, been frequently forc'd against it. For it was not like a membrane which was drawn transversely; but resisted like a very solid and thick paries.

Having remark'd these things, I inquir'd of the woman; who was as yet in the flower of her life, and enjoy'd perfect health; whether she, like other women, did not perceive blood to flow from thence sometimes, if not every month; or, at least, if, at certain intervals, pains did not arise about the loins, and the pubes; but she answer'd to all these things in the negative: so that I began to suspect the same thing as in the second: and after describing to you her case, I will communicate my suspicion to you.

12. This second woman related, that she was not indeed imperforate, but had so very narrow an aperture, that an eminent physician in a city of great learning, who was at the same time a surgeon, having examin'd her in early puberty, advis'd that this aperture should be gradually dilated, by introducing such things as were proper for that purpose; but that every thing else a more mature age, and a husband, if she should marry, would accomplish.

She likewise said that she had introduc'd something of the kind recommended at sometimes, and in some measure; and had by this means a little dilated the orifice of the foramen; but could bear no farther dilatation: that her husband also, to whom she had been married three years, had by frequent attempts somewhat more enlarg'd the same orifice; but never could enter it.

After hearing this relation, I inspected the parts with this intention, that if a pretty thick hymen, or one that open'd by a very small foramen, were the obstacle, I would persuade her to undergo the incision, as other practitioners have done, and among these Blasius (*x*); but if the stricture went very high up into the vagina, that I would consider what, and how far any thing, was necessary to be done; for the celebrated Benevoli had not as yet given his example of an equally easy and successful cure (*y*), to serve as a pattern for our imitation; as his observations did not come out till many years after.

For the method of cure which is given us by Blasius (*z*), as perform'd on a certain woman, to whom this had happen'd from child-bearing, was too severe; not to say, that, on account of the intestinum rectum being wounded, it was very long in being completed.

(*u*) De med. hist. mirab. l. 6. c. 2.

(*x*) Part. 2. obs. med. 6.

(*y*) Osservaz. 2.

(*z*) Part. 2. cit. obs. 7.

And that the woman being at length made pregnant, as happen'd to her whose history is given by Antonius (*a*), the vagina might be dilated even by utero-gestation itself, I was rather cautious of supposing; as I consider'd this in the number of very extraordinary instances.

And you will, at least, see that the same thing did not happen to another woman, who is spoken of in the same books (*b*); and you will also see with how much labour, and if you attend to what follow'd, with how much danger likewise, Benevoli (*c*), together with Querci, was oblig'd, during the pains of child-bearing, to dilate the vagina, which was contracted for half its length, by reason of a wound which had been receiv'd in childhood; whereas those two may seem to have been born thus.

These five women, however, had, all of them, a small foramen, through which there was some passage to the uterus: such as I also suspected there was in her whose history I have begun to describe.

But when I saw the foramen, of which the woman had spoken, I immediately knew that it was the orifice of the urethra out of its situation; and that thanks ought to be given to God, that the woman could not suffer any farther dilatation of that passage; as, if she had, the consequence, without doubt, would have been, that she could never have retain'd her urine.

From whence you perceive, that so great a want of anatomical knowledge, as not to distinguish the orifice of the urethra, to the great detriment, or at least to the danger, of the patient, is not only found in vulgar surgeons and barbers; of whom some similar instances are related by Platerus (*d*), and Peter de Marchettis (*e*); but also in physicians of eminence: unless it is more proper, in this case, to accuse either the haste of the examiner, or the prejudg'd opinion that he had form'd to himself, from what had been improperly related to him of a narrow foramen.

Then turning my eyes to that part of the genitals, which follows next behind this orifice; that is to say, in which the orifice of the vagina is wont to open; not the smallest foramen, nor perforation, appear'd any where to the inquiring eye, though never so attentively applied: this place was entirely shut up, not with a membrane which would yield to pressure, but with a very firm and solid paries.

As I was in doubt what advice in particular to give; for the question was not here of "the genital part being concreted," as in Cornelia the mother of the Gracchi (*f*), that is, of the edges of it "being agglutinated to one another," as Celsus says (*g*), or of "a membrane plac'd at the opening of "the *vulva*," which the same author takes notice of (*h*) (the methods of cure in which cases are neither unknown nor difficult) but of a case which call'd to mind one that I had read in Nabothus (*i*), of a physician endeavouring to remove, with the knife, a coalition of the vagina, which had likewise been from the birth, but being oblig'd to desist from his attempt, when he saw that the coalition was continued up very high, and that the large sanguine-

(*a*) Hist. de l'Acad. R. des Sc. a. 1712 obf. anat. 2.

(*b*) Hist. a. 1748. obf. anat.

(*c*) Offervaz. 5.

(*d*) Obf. l. 3. ubi de part. Procid.

(*e*) Obf. Med. Chir. 60.

(*f*) Apud. Plin. Hist. Nat. l. 7. c. 16.

(*g*) De Medic. l. 7. c. 28.

(*h*) Ibid.

(*i*) Disput. de Sterilit. Mulier. n. 7.

rous vessels appear'd; and also brought to my thoughts the opinion of Nabothus (*k*), that "if there be a fleshy interstice," by which we must understand a pretty thick one, "it is better to abstain from the incision of it, partly on account of the very great hæmorrhage, and partly on account of the inflammation that would follow:" as I was turning over these things in my thoughts then, it very properly came into my mind, to ask the same questions that I had ask'd of the former woman (*l*), whether any menstrual blood had ever been excreted? Whether she had any uneasinesses at intervals in the loins, or the pubes?

For, from the time of Aristotle's having said (*m*), "that in some women the os uteri, being compress'd, and incorporated with the other parts, had continu'd in this state from their earliest time of life, quite to the time of their catamenia; but that, soon after, the menstrua coming upon them, and they being troubled with pain, this coalition was spontaneously ruptur'd in some, and in others cut asunder by the hands of the physicians;" I well remember'd how many, and what kind of, evils, a number of women had suffer'd from the menstuous blood being collected in the vagina, and the uterus; till the surgeons before and after our Fabricius ab Aquapendente (*n*), reliev'd these disorders by cutting the impervious membrane, at the orifice of the vagina: for that Fabricius should have doubted (*o*), whether this was what Aristotle meant by the os uteri in that passage, I am greatly surpriz'd; as if the occlusion of the orifice, of the vagina, might not be so great sometimes, that, whether the obstructing membrane be "violently ruptur'd," as Aristotle says, or as Fabricius says, cut asunder "in some women," as the former had immediately written, death might be the consequence of it; for that this may be the consequence, you even sufficiently conceive, from what I have just now hinted on the subject.

And how many, and various, disorders these women had suffer'd before their cure, we may learn, by examples, from Donatus (*p*), from Severinus (*q*), from the two Fabricii, both ours (*r*), and Hildanus (*s*), from Ruysch (*t*), and from Nabothus (*u*). To which you will moreover add those that other authors, and among these the celebrated Fantonus (*x*), and Kannegiefferus (*y*), have describ'd.

For Benevoli, who had cur'd three patients of this kind, by reason of his mentioning the cases in a cursory manner (*z*) only, has omitted to add, with what disorders they had been previously affected.

Nor indeed, have those women only, who were born with an occlusion of their vagina, been subject to these disorders; but those also in whom the orifice of the vagina had grown together, after a difficult birth: to which kind

(*k*) Ibid. n. 23.

(*l*) N. 11.

(*m*) De Generat. Animal. I. 4. c. 4. sub. fin.

(*n*) De Chirurg. Oper. ubi de Hymene imperfor.

(*o*) C. seq.

(*p*) C. supra n. 11. cit.

(*q*) Chirurg. Effic. P. 2. ubi de Section. c.

46.

(*r*) Loc. cit.

(*s*) Cent. 2. Obs. Chir. 60. exempl. 3.

(*t*) Cent. Obs. Anat. Chir. 32.

(*u*) Disp. cit. n. 4.

(*x*) Opusc. Med. in Schol. ad Patris, obs. 30. n. 3.

(*y*) Act. n. c. tom. 6. obs. 88.

(*z*) Osservaz. 1.

of histories you will add that which you find taken notice of in the *Commercium Litterarium* (a).

For when there is no perforation at all (from what cause soever this may be) through which the blood flowing together within the uterus may be discharg'd; this retain'd fluid must, of course, produce considerable disorders.

But if there be any foramen, such women are not to be consider'd as quite imperforate; nor is it to be wonder'd at if some of them become impregnated: as of those five, whose very great narrowness of vagina I spoke of just now, three actually were; as another was also, whose case is describ'd by Hildanus (b); whereas, in the membrane that shut up the vagina, there were some very small foramina.

Wherefore, in all these women, the menstruous purgations were discharg'd by the natural passages, though these passages were very small: and if this circumstance were inquir'd into by some persons, who had it not in their power to inspect these passages, but only to learn from the husbands of the women, that their wives were impervious to them; it would be a sufficient testimony, to prevent them supposing, that, when these women became pregnant, this must have happen'd without the admission of the semen virile: and we should, perhaps, have fewer examples, in books, of women being quite imperforated, than we have at present. But as these women were not without their menstrual purgations, so they were free from the disorders which we have said that blood collected in the vagina and uterus must of course bring on.

Having then consider'd all these things, and hearing, not only that neither of these women, whom I examin'd, had ever had any menstrual purgation, but not any uneasiness or pain tending thereto, nor even the slightest beginning of them; and on the other hand, seeing that both of them were endow'd with very good health, colour, and strength; as every healthy woman is at that time of life which may yet be consider'd as the prime; I began to suspect, that, as they were without a continued and open canal, or orifice of the vagina, they might, perhaps, also, be without a uterus, from the original formation: so that if the obstacle could even be remov'd by the surgeon's knife, there would, nevertheless, be danger, lest the bladder, or some one of the intestines, lying in contact therewith, in consequence of the uterus being absent, should be pierc'd through at the same time; in the same manner as there was a very considerable danger, of this kind, in infants (of whom I have already spoken (c)) who had the anus imperforate, and, at the same time, a total deficiency of the intestinum rectum.

I therefore persuaded both these women placidly to suffer a marriage, which was improperly contracted, to be dissolv'd; rather than imprudently submit themselves to the incision.

13. Nor would I have you object to me that there have not been wanting, nor are at present wanting, women who live in very good health without any menstrual purgations: for I confess it, and even know some such

(a) A. 1754. hebd. 25. ad finem.

(b) Obs. 60. cit. exempl. 2.

(c) Epist. 32. n. 3.

myself; but I have often had the same doubts in regard to them, that I have had in regard to the two whose histories I have describ'd.

Yet you will say; there are many who have born children, and, nevertheless, been without these purgations. But take away, from the number of them, all those that live in a climate far different from ours: take away those that they call viragos: take away even those who do not enjoy perfect health; and you will find that these many will be reduc'd to a very few.

Yet even upon this supposition, you will say, there are more in number, than of those who are born without a uterus. And I would confess this comparison to be properly made, if it were as easy for physicians to observe the number of the latter, as it is to observe the number of the former.

For the former, of themselves, spontaneously declare it, inasmuch as it is a circumstance; if you consider the sex in general, and the regions of the world, in general, that are not very remote; which is certainly very rare and surprizing.

And out of all the others, who, compar'd with those very few, are so many the more in proportion; I mean out of all those who live in good health; without these purgations, but never bear children, how many of their bodies have been dissected after death? And unless you dissect them, certainly neither they themselves, nor any one else, can inform us, whether they are furnish'd with a uterus, or not.

Since, therefore, it is impossible to know either case for a certainty; who, that is a prudent man, would be so bold as to undertake to remove an obstruction of this kind, that he may happen to meet with, in like manner as he would, if he were certain that there was an uterus within; when, at the same time, the operation is neither necessary to preserve life, nor to remove any disease; and perhaps not only without any advantage, but even dangerous; especially if the obstruction be such, that either its situation, or its thickness, and hardness, shew it not easy to be remov'd, and not without great danger?

I know of two women (for I have not the book, by me, in which the third is spoken of, who is refer'd to by the celebrated Caspar Bose (*d*); but I read of a fourth (*e*) who was imperforate, and without any traces of a vagina, yet not without some slight, though useless, appearance of the uterus); I say I know of two women, whom anatomy has shown to have been born without a uterus; the one dissected by our Columbus (*f*), the other by his celebrated fellow-citizen Fromondus (*g*); so that this very circumstance is a proof to me, that many more of those who never have had any menstrual discharge, might have been found, by anatomists, to be without any uterus: for though this may seem to be very extraordinary, yet it must seem much more extraordinary, that if there had been no other instance of the kind, both of these should have happen'd to be met with by anatomists of Cremona.

As in both of these women the uterus was wanting, so also an open passage, that led to the seat of the uterus, was wanting; so that you may compare the first, in whom there was only a portion of the vagina, with the for-

(*d*) Disp. de Obstetric. Errorib. & cæt. §. 7.
in fin.

(*e*) Disp. Anat. ab Haller. collect. tom. 5.
p. 227.

(*f*) De Re Anat. l. 15. in ipso fine.

(*g*) Imperfor. Mulier. & cæt. Observat.

mer of the two that I examin'd; and the other, who had the orifice of the vagina imperforate, with the latter of those that I inspected.

If any surgeon had attempted to open the passage, in that body seen by Columbus; he would, at the same time, have cut into some viscus, that was contiguous to the fund of that vagina; from the compression of which viscus, it, perhaps, was, that the woman "complain'd in a surprizing manner, when-
"ever she copulated with her husband."

If any persons had undertaken to cure with a knife, that woman seen by Fromondus; they would, first indeed, have met with a septum which was strong and firm, "and so interwoven with solid fibres, as to approach nearly
"to the nature of a cartilage."

And while this was cut through, which would necessarily require some force, nothing could more easily have happen'd, than that, while they suppos'd themselves at the entrance of the cavity of the vagina, they should wound the parietes of that cavity, which had coalesc'd with each other; and perhaps even the rectum intestinum, which lies in contact with them, or the urinary bladder.

Finally, these parietes must have been separated. And who can take upon him to say, that none of these circumstances were to be apprehended, in the women inspected by me? Nobody certainly; nor yet that the uterus was not wanting in these, as it had been in those who were dissected.

Besides, the uterus is sometimes so small, even in adult women, as to have the same effect that the absence of the uterus would have: which I shall confirm below by my own observation (*b*); if, as I have already spoken of the external orifice thereof, that is the orifice of the vagina, being shut up, you will first give me leave to add a few things, in regard to its os internum being obstructed.

14. Mention is made of the os uteri being shut up, in more than one of the books of Hippocrates (*i*). The causes of this occlusion may be many and various: the greater part of which have been examin'd by Vallinieri (*k*), who divides them into the external and internal. Let us consider some of them.

Among these they plac'd formerly, with Hippocrates (*l*), "the omentum
"compressing the os uteri," in very fat women. And in what manner Vesalius explain'd this, you will learn, somewhat more at large, from the Sepulchretum (*m*); for Vesalius himself contracted that passage (*n*) in his later editions.

Without doubt this excellent anatomist saw, on the one hand, how soft the omentum is, and, on the other, how thick, and capable of resistance, the parietes of the osculum uterinum are.

He therefore conceiv'd the omentum to descend so far betwixt the bladder and this orifice, that, by pressing the soft parietes of the vagina, at its upper part, one against another, it might shut up the passage, for the semen, to

(*b*) N. 20.

(*i*) De Nat. Muliebr. n. 33; de Morb. Muliebr. l. 2. n. 50; de Sterilib. n. 1. & cæt.

(*k*) Ist. della Generaz. p. 3. c. 1. n. 5. & seq.

(*l*) Sect. 5. aph. 46.

(*m*) Sect. hac 34. obs. 4. in Schol. ad §. 4.

(*n*) De Corp. Hum. Fabr. l. 5. c. 4.

the neighbouring os intenum, by its bulk, and weight; so that the penis when introduc'd, especially if pretty short, or languid, could not reach to the upper part of the vagina, nor be able to distend it.

Which explication of Vesalius, I can with less difficulty admit, than suffer that some of the more modern anatomists should follow the naked dogma of Hippocrates: although I cannot conceive of the omentum, as lying betwixt the upper part of the vagina and bladder, unless we suppose the cellular connexions, which usually are seen betwixt one and the other, in that part; and even sometimes a little higher; to be torn through: which connexions, as, in very fat women, they are themselves stuff'd up with fat also, may not, perhaps, yield so easily, and give place to the weight of the omentum.

And as, in women of this kind, all the cellular membranes are distended with fat; it is natural to conceive, that, from the neighbouring intestines being very fat, or from fat being accumulated in the membranes of the Fallopian tubes, in their fimbriæ, or, at least, in the membranous ligament which they call the *alæ vespertilionum*, all these parts, or some of them, may be obstructed in their motions necessary to generation; for thus I choose to interpret Vallisneri (*o*), or at least to add something to his explication.

15. And among the causes which obstruct the os uteri, the same author supposes, together with others, excrescences form'd in the cervix uteri (*p*); and with Hippocrates himself, stones also (*q*). The observations that I have made upon excrescences I defer to the next letter.

Calculi I have never yet found in the uterus: which, however, I know have not only been seen formerly in that place, by others, but even in my own memory; and these histories are refer'd to by Vallisneri.

But I could wish that he had read many, and even all, of those that are collected by Schenck (*r*); as, in another place (*s*), he has with difficulty granted this: "that it is not improbable, but even stones may be, also, generated in the uterus."

For by reading over these histories, and by adding others moreover; as, for instance, that you meet with in Bartholin (*t*), and in like manner that which you have in the Sepulchretum (*u*); he would have understood very clearly, that stones had been actually found, in the very uterus of women, after death, so many times, and by such men, that it was not at all necessary to suspect, that if any calculi were said to have fallen, or been taken out, from the uterus of living women (as, for instance, in that servant-maid Larissæa spoken of in Hippocrates (*x*)), they had been discharg'd from the bladder; notwithstanding no particular symptoms of a stone form'd in the bladder, did now exist, or had preceded; rather than from the uterus.

16. Moreover, among the internal causes that shut up the os uteri, is the constriction, or conglutination, of that orifice, examples of which you will find produc'd by the celebrated Haller (*y*); whereto you may also add others:

(*o*) N. 5. cit.

(*p*) Ibid. n. 6.

(*q*) Ibid. n. 7. &c. 2. n. 42.

(*r*) Obf. Med. l. 4. *prope fin.*

(*s*) Opere t. 3. p. 3. n. 12.

(*t*) Cent. 4. Hist. 64.

(*u*) L. 3. f. 24. obs. 18. §. 10.

(*x*) Epidem. l. 5. n. 12.

(*y*) Ad Prælect. Boerhaav. ad Instit. §. 675. not. i.

as those of our Fabricius ab Aquapendente (*z*), and the very experienc'd Be-nevoli (*a*); from whose observation you may suspect, that, besides the constric-tion, there was, perhaps, some membrane, which shut up the os uteri, even from the original formation.

And indeed the same Fabricius (*b*) says, that he, by introducing his fin-gers into the vagina in the living body, had observ'd "the membrane which forms the vagina, to be continued through the whole, and conceal the ori-fice of the uterus:" and Littre (*c*) saw, in the dissection of a barren wo-man, the membrane that invests the vagina, internally, adhering to the os uteri in the same manner as it did to the surface of the vagina; by which means that orifice was shut up.

But Hippocrates did not doubt (*d*) that a membrane might "grow out over this orifice," even after birth. "When a woman cannot admit the male semen, it cannot be," says he, "but that a membrane must have grown out over the osculum uteri." What I have seen of this membrane, the following observation will show you.

17. A woman of fifty years of age; who was so lame that the lower limb, on the right side, was shorter by four fingers breadths, than the left; died of an asthma in the hospital, about the latter end of January in the year 1747: at which time I was teaching anatomy, as usual, in the college.

The chest was very narrow, and when open'd show'd water to be contain'd therein: other circumstances they did not inquire into, as they were in haste, and solicitous about nothing else, but to take out, with accuracy, the parts which are form'd for the sake of the urine, and for generation, and to bring them to the college.

I examin'd the parts destin'd to both these offices with attention. In the former, after having seen the arteries which go off from the annex'd large trunks, and the iliac veins, to be more slender on the right side, than on the left; I observ'd the kidneys to be not small, when compar'd with the stature of the woman which was of the lowest: these kidneys were found neverthe-less, as far as I could judge: so also in the bladder, the lower part of which appear'd to be affected with a phlogosis, I remark'd that the orifices of the ureters were somewhat larger than usual.

In regard to the genital parts; to pass over what does not belong to this place, and in particular the hymen, and other things, which show'd the woman to have been a very perfect virgin, contrary to our expectation; first, out of these things which I had it in my power to observe without dissection, there was the same phlogosis in the hymen only, and the nearest external surface of the pu-dendum; and from this surface, likewise, arose very small preternatural tuber-cles, which were in like manner red: and there was a phlogosis also in the Falloppian tubes, and the alæ vespertilionum: but the testes were scirrhus, and of a surface that was divided into a kind of squares, or chequer-work.

(*z*) De Chir. Oper. ubi de Vitiis quor. caus. Fœminæ concubuit. non admitt.

(*a*) Observaz. 1.

(*b*) Loco modo cit.

(*c*) Hist. de l'Acad. R. des Sc. a. 1704. ob-serv. anat. 13.

(*d*) De Sterilib. n. 13.

Then opening the fundus uteri, and the upper part of the neighbouring cervix, I observ'd the surface of the former to be of a bright red colour; but the surface of the latter not to be so much as inclin'd to redness.

In the fundus, whether you look'd upon its anterior, or posterior parts, were very low excrescences, of no inconsiderable circumference however; being smooth, and scarcely sunk lower than the surface; which were of a red colour, and more inclining to brown than the rest of the surface.

Moreover, in order to examine the remaining part of the cervix, before I cut into it, I pass'd a thin probe from the fundus uteri towards the orifice; but found that the passage to this orifice was not open.

Wherefore cutting into the vagina, and bringing this orifice to view, I endeavour'd to pass up a probe from the lower opening, but in vain; whereupon I examin'd the part with attention, and saw that the orifice, and its prominent corona, were in a natural state, except that, at a little space below the orifice, it shew'd some small corrugation as it were.

The orifice itself was very narrow, and quite in the form of a circle. When I examin'd it internally; at a very little distance from thence, a small whitish membrane came to view, which perhaps streighten'd the passage, but certainly shut it up: and this made an obstruction to the probe, either in passing upwards, or downwards.

Nor indeed was this to be reckon'd among the valves which I have delineated (*e*), in a former work, in the cervix of the virgin uterus; for none of these shut up the passage of the cervix except in part, and are all of them so situated, as to resist the ascending probe indeed, but to give way to the descending.

Yet I will not deny but this little membrane, which I just now describ'd, might be perforated with some small foramen, as Littre (*f*) saw in his; or had at least left a very small interval in some part of its circumference, betwixt itself and the parietes of the cervix; since I found no fluid collected in the uterus: unless we suppose it to be a membrane not of long standing, and that the fluid might have been taken up by the absorbent vessels.

18. And I should rather suppose, that Nabothus (*g*) had refer'd to something of this kind, or a somewhat more interior appearance, when he said, "that an extraordinary narrowness of the internal orifice, of the uterus, could no more be known" in the living body, "than a solitary diseas'd conformation of the ovula." For this learned man could not be ignorant, that it had been more than once asserted, to this effect, by Hippocrates (*b*): if the "os uteri is shut up; it becomes thick, as if the woman were pregnant: and if you touch it with your finger, you will find it hard and convoluted, nor does it admit the finger;" and that experienc'd surgeons do every day, by introducing their finger, for examination, reach quite to the os uteri, especially when the woman is in a standing posture.

And indeed the same orifice, in a different posture of the woman; that, for instance, in which they introduce what is call'd the speculum uteri; may be brought into view, even without that speculum, as I have more than

(*e*) Advers. Anat. 1. tab. 3.

(*f*) Supra ad n. 16. cit. loco.

(*g*) N. 20. Disp. supra ad n. 12. cit.

(*b*) De Morb. Muliebr. l. 2. n. 50. & de Nat. Muliebr. n. 33.

once seen : especially if the vagina be pretty short ; by introducing, for example, instead of the speculum, an ivory or chrystal funnel, of a proper length and breadth ; and a light at the same time, if it be necessary ; in the manner which was formerly pointed out by me, on another occasion (*i*).

19. The obliquity of the os uteri, also, may resist the entrance of the semen. And this obliquity of the os uteri, is the natural consequence of the obliquity of the uterus ; as Hippocrates (*k*) has taught us, by saying, “ if the uterus becomes oblique, the os uteri becomes oblique also.” But as I am to treat of the oblique uterus in another letter (*l*), I go on, at present, to subjoin my observation, of the very small uterus, which I have promis’d you.

20. A little woman ; of about sixty-six years of age, of a stature much below the middle size, yet much larger than to be class’d with the species of dwarfs ; who, having been for many years the wife of a porter, that was now dead, a robust man, but weak in his mental abilities ; had never born any children ; last of all, before the middle of December 1749, came into the hospital in a very weak state, but complaining of nothing besides hunger (for she was a beggar) and of the injuries of the cold season. While she lay in the hospital therefore, to repair her strength, behold she was seiz’d with a sudden deliquium animi, and within an hour was carried off.

On opening the belly, they immediately found the cause of her sudden death, that is, an abscess ruptur’d in the mesentery ; whereby a great quantity of stinking matter was discharg’d into the cavity of the belly : which circumstance brought on the fatal event, in this old woman, so much the sooner, than in the carman describ’d by the illustrious Heister (*m*), as her strength was so much the more pull’d down, as I suppose, and her time of life so much the more advanc’d.

And when this matter was exhausted, and wip’d away, and the mesentery, together with the intestines, remov’d, they immediately went on to take out the urinary, and genital, parts from their situation, agreeably to my orders ; as both of them were to be demonstrated there, to the students in anatomy, in the same manner that I had, the day before, demonstrated these urinary and genital parts from a male.

And this I did, not to show them the natural state of the parts, as at other times ; but that they might see their preternatural state, when it so happen’d, and in part the more rare constitution thereof.

And in the kidneys indeed, there was such a disorder, as to show those vesicles full of serum, partly prominent on the surface, and partly half-buried in the substance ; especially the right, which had a large one at its lower extremity, and the surface besides, if you look’d upon it attentively, unequal.

Yet the ureters were not dilated, but even open’d by very small orifices in the bladder, which was found ; except that, notwithstanding the rest of the coats were contracted into themselves, the external was, nevertheless, not

(i) Epist. 14. n. 13.

(k) Libro novissime cit. n. 34.

(l) Epist. 42. n. 31. & seq.

(m) Diff. de Hern. Carnof. §. 28.

only very lax, but even easily separable from the other: so as to follow the hand upon being slightly drawn.

Finally, if you look'd upon the internal surface of the urethra, which was of a proper length, you might see some very small vesicles here and there.

But; in the genitals were a great number of deviations, from the usual order of nature. For to say nothing of the smallness of the pudendum in a woman of that age, and the wife of a porter, and the very remarkable diminutive state of the nymphæ, so that only the beginning of them, and that very short, and slight, appear'd; the glans and præputium clitoridis were no where at all to be met with: but in the place of both these parts, was a round and but little prominent tubercle, cover'd over with the same skin as the pudendum itself.

Upon cutting into this tubercle, I found a quantity of matter, entirely of the same nature with that which is collected under the præputium of the clitoris, and of the penis; being whitish, and half-dried, and, for that reason, dispos'd into pellicles, as it were, which lay one upon another, as it generally does in a dried state: and under almost the lower part of that matter, I found the glans clitoridis, and its præputium; both of them slender and small; so that the much greater part of this protuberance was made up of that matter.

And these things I have here describ'd the more at large, because, by this observation, a certain doubt (which Santorini (*n*) had weaken'd) of Boerhaave's (*o*), who was in other respects a very great man, is remov'd.

For certainly, as the skin, when cut into by me, show'd neither any sign of a foramen, nor had the least trace of any cicatrix; the matter could never have been collected there, that had come from the small canals of the urethra; nor yet from the other neighbouring glands; so that it is now very evident this matter must be deriv'd from the sources which are in the glans, or præputium, of women; and consequently, of men also.

However, neither the body of the clitoris, nor the crura, nor any of those muscles which are generally ascrib'd thereto, were wanting: but the plexus retiformis was of a very slender thickness.

And although but just a slight trace or two of the hymen remain'd, yet the orifice of the vagina was so narrow in its dimension, that it seem'd never to have admitted a man: it certainly did not equal the dimensions of my middle finger in any direction, nor would have admitted it.

The breadth of the vagina, when open'd longitudinally, and display'd, was scarcely more than two fingers breadths, at the same time that the length was not equal to four. There were no caruncles within, no rugæ; if you excepted a very short and narrow corrugation, as it were, behind the other side of the orifice of the vagina.

The os uteri was surrounded with no protuberating corona, and was almost of the form of a circle; but so small as not to admit the head of a little probe.

(*n*) Obs. Anat. c. 10. §. 12.

(*o*) Epist. de Fabr. Gland.

From thence, to the upper and outer part of the fundus uteri, there was not so much distance as to be equal to the largest breadth of my thumb. Nor was the upper part, that is the widest part, of the uterus, wider than the length I have mention'd; for the other part did not equal even the width of the point of my little finger; even if look'd upon before it was cut into.

In cutting into it, I found the thickness of the parietes, both of the fundus, and of the cervix, to be considerably less than in that figure of de Graaf, where (*p*) he represents the uterus of an infant, who died on the twenty-third day after she was born; and where they are represented to be extremely thin.

From this figure, when compar'd, in length, with that which I refer'd to just now, you will easily conceive, that the uterus of this woman, of whom I speak, does not seem to have increas'd since the time of her birth; or if it grew in length in its upper part, at least that it had grown far less, in proportion, than the other parts of the body, though in a little woman; and certainly, that it had never discharg'd any menstrual blood.

However, as you see in that figure, so in this woman also, the cavity of the cervix was twice the length of the fundus uteri; but in the cavity of the cervix some fibres only could be very obscurely seen, and these in a longitudinal direction: and the internal surface of this cavity was white; whereas that of the fundus was of a redish colour inclining to brown.

Nevertheless, the Falloppian tubes were much longer than such a smallness of the uterus seem'd to promise; and the orifice betwixt the fimbriæ was open: although I found the fimbriæ of one of them externally rough with whitish, and roundish bony bodies, or at least such as were very hard in their consistence.

In the *alæ respertilionum* was no plexus; yet many nerves ran upon them in the longitudinal direction. The round ligaments of this uterus were very slender. But the broad ligaments were very large: which was the consequence of the uterus being so very contracted in its breadth.

I look'd upon the upper edges of these ligaments, to see what kind of testes this woman had been furnish'd with; but look'd to no purpose. Then pursuing the spermatic vessels with great accuracy, which seem'd to be not much smaller in this body than usual; particularly where they went to the broad ligaments of the uterus, with the neighbouring portion of the peritonæum (from whence these ligaments begin) which was still annex'd to them; I very clearly perceiv'd that she had never had any testes, nor even the most obscure beginning of them.

21. From these appearances, which I demonstrated in a very crowded circle of students, you must, in my opinion, be abundantly convinc'd, that it was just the same thing to this woman, to be furnish'd with such a very small uterus, as if she had been entirely without. And how rare this smallness describ'd by me is, you yourself will be able to judge, from all the examples of a small uterus that are collected together in the *Sepulchretum*.

Amatus indeed says (*q*), "that a uterus of this kind," that is to say, a

(*p*) De Mulier. Organ. tab. 24. fig. 4. contra litteram G sinistram.

(*q*) In additam. ad sect. hanc 34. obs. 2.

contracted and small uterus; “ is every now and then seen in some women; “ particularly in barren women, and those that have born no children: and “ in these women the breasts are also small and contracted, so that from “ them even the smallness, and contracted state, of the uterus may be argued.”

And indeed I have known some barren women, who had scarcely any appearance of breasts; or indeed none at all, besides the nipple and the areola. But what kind of uterus is it that Amatus refers to? Why one that he had seen “ betwixt the intestinum rectum, and the bladder, in a contracted state, “ so as to be taken, by unskilful observers, for another bladder.”

But can you suppose that any person whatever, even the most unskilful, could have taken that which I saw for a second bladder; so very short and narrow as it was, and almost of no thickness at all?

And the same reply may be made, in respect to the observation of Judæcius (*r*), on another barren woman, which represents the uterus as being “ contracted to the size of a small apple.” Which observation is taken no notice of in this section, as according to the intent of the section it certainly ought.

But it is taken notice of in another (*s*), wherein the uterus is said to have been “ very small and contracted, like that of a girl of ten or twelve years of “ age.” Which, for this reason, was nothing in comparison to the smallness of that observ’d by me; although that, besides, could not be said to be compress’d by the bag, which took its beginning from thence, and fill’d the capacity of the belly, even from six years of age.

Finally, two observations are describ’d from Riolanus (*t*), which, if you read them somewhat attentively, you will find to be one and the same. Nor indeed is there any other difference, except that, in the former editions of the *Anthropographia* (*u*), from whence the first observation is copied, the name of the matron is mention’d; and in the later editions, from whence the second is taken, is omitted; for as to the number of the chapter corresponding in neither place, probably this may be owing to the carelessness of the printers: but the tubercle, which is taken notice of in the cervix, and is consider’d, in the *Sepulchretum* (*y*), as the cause of barrenness, Riolanus seems, if you attend to what he has premis’d, to have consider’d as the cause of fecundity; especially as this matron had not been barren, but had even brought forth three children.

But be these things as they will; what concerns our present subject is, that, although “ she died at the age of fifty-five, she had her uterus very “ small, very hard, and almost cartilaginous.

You see however, that the degree of smallness remains undetermined by the author; and although this might have been very considerable, yet it had not been so from the birth, as it was in a woman who had brought forth three times; but you see that it was from a disease, which, as it had made the uterus so hard afterwards by degrees, might also have been the cause of its contraction.

(*r*) Quæ 1. est in additam. ad sect. 10. l. 2.

(*s*) Sect. hac 34. obs. 4 §. 17.

(*t*) Ibid. §. 3. & 5.

(*u*) Ut in illa a. 1626. l. 2. c. 34.

(*x*) Ut in illa a. 1649. eod. c.

(*y*) Vid. inter titulos obs. 4. post n. 4.

And I would have you call this to mind, when you light on other observations of this kind, and particularly on one in which (z) you will read, that the uterus of a woman, who had been carried off by a long-continu'd encysted dropfy "did not exceed the magnitude of a nutmeg; yet was in-
"dured like a cartilage." And another observation (a), wherein they found the uterus "finall like a pidgeon's egg," you will have opportunity of explaining in the next letter (b).

22. But in my observation there was, moreover, this extraordinary circumstance, that the testes were wanting: which were not wanting even in both of those women, in whom we have said that there was no uterus at all (c); but only in the first. And if I were determin'd to give you a particular account, in this letter, of all the diseas'd appearances that I have seen in the testes, and the tubes, by dissection; this letter would grow out to a more enormous size than any other.

But without doubt I should be only giving myself needless trouble, since I have either given accounts of them in letters already past, or shall hereafter give them. I will therefore hint at some things here, which otherwise I should not find a proper occasion to introduce; first of the tubes and then of the testes.

23. In dissecting the genitals of a woman, about fifty years of age, and demonstrating them in the hospital, in the beginning of April in the year 1743; I observ'd the following things.

The corona of the os uteri, which was very thick, had, moreover, a roundish prominence from one part; which, on cutting into it, I found to be white internally, and, to appearance, scirrhus. And neither of the tubes admitted a very thin probe, which was already introduc'd through the larger orifice to some extent, beyond that place: and, in fact, I found both of them to be quite impervious.

24. I dissected the brain, and genital parts, of another woman, who had been taken off by an acute disease of the thorax, succeeding to a chronic, before she was forty years of age; but the brain it is not our business to speak of here: as to the parts of generation; which I demonstrated in the same place and the same year, and about the middle of December; I found some appearances in them, that well deserve to be related here.

To begin with the pudendum, in which the hymen, being uninjur'd, show'd this woman to have been a virgin; the redish horns of the semilunar, and, in other respects white, hymen, terminated in a kind of redish ring; with which the tumid extremity of the urethra was surrounded.

And the other orifice of the urethra, which opens towards the bladder, and the internal surface of the urethra that was nearest to it, was distinguish'd with parallel, thick, and protuberant lines drawn longitudinally; which lines were vessels distended with blood.

The vagina, the osculum, and the cervix uteri itself, I found to be in that state in which they generally are.

(z) *Commerc. Litter. a.* 1731. *Spec.* 19.

(b) *N.* 26.

m. 2.

(c) *Supra*, n. 13.

(a) *Eph. n. c. cent.* 1. & 2. *obs.* 105.

But the fundus uteri protuberated somewhat more than it generally does; nor could I find the caule of this protuberance in the parietes, which were in a natural state: but I found it to be in the cavity, upon the surface of which three excrescences were form'd.

The largest of these was somewhat less, in its circumference, than the nail of a man's thumb; not very thick, and loose on every side: unless where it was join'd, by no very slender peduncle, with the upper side of the left part of the cavity: internally and externally it was in great part so full of blood as to be quite black: and it was somewhat less hard than the substance of the parietes of the uterus.

At the upper part of the opposite side was an equal blackness likewise; but no excrescence in that part.

The second excrescence was at a little distance below that place, being somewhat round in its figure, rather small in its size, and nearly of the same nature with the first.

The third which was very small, was situated a little below the first; and, when prick'd with the point of the knife, discharg'd a water, as if it contain'd an hydatid within its outer shell; which was of a black colour inclining to that of blood.

Having examin'd these parts sufficiently, and turn'd my eyes to the alæ vesperilionum; in each of them, betwixt the testis itself and the tube, I observ'd three or four globules of a larger or lesser size; hard in their consistence, and of a red colour inclining to brown; so that at first sight, I suppos'd them to be scirrhus conglobated glands.

But, upon applying the scalpel, under the membranous cortex, which was of the colour I have mention'd, I found a nucleus of a white colour, smooth, and easily falling out; so hard that you would have doubted whether it was of a bony, or a stony nature: and in its figure and magnitude, if you consider'd it when taken out of the larger globule, it resembled a middle-siz'd pea.

The lesser globules each contain'd a nucleus similar to this, but less in its size; except that, in one of the smallest, instead of a nucleus, was a white but softish matter: so that you would naturally have suppos'd the hard nuclei to have been form'd by the concretion of this matter.

You plainly see what impediment there must have been to the motion of the tubes, and their nearer approach to the testes, by the weight and interposition of this kind of globules. But the testes moreover were dry, contracted, and strigose. And the tubes were impervious, in the same manner as I have related of the former woman; except that they, nevertheless, admitted a very thin probe somewhat nearer to the uterus.

25. Although I have, in fact, sometimes found the same kind of occlusion in the Falloppian tubes, of other women likewise, as well as in these two; which you learn from other letters; yet I at the same time confess, that there have been still more, in whom, though I thought them to be shut up at the first trial, I nevertheless found, by a more accurate examination, that they were really pervious: and what I had written in the first of the *Adversaria* (d), formerly, I have since confirm'd at different times.

And that the same has likewise been observ'd by others, is prov'd by the testimony of the very experienc'd Haller (*e*); who says that "Morgagni, in the first of his *Adversaria*, justly argues against Ruyfch, that the tubes "are not so very frequently obstructed." But as Ruyfch, in the observation (*f*) which it is surprizing to find not added to the *Sepulchretum*, had very clearly propos'd two modes of obstruction of these tubes; one of which is when they are very closely coalesc'd, at one extremity, with the testis, the second when they are obstructed in a different manner; it might have been evident to every one, who read these *Adversaria* of mine with attention, that I had not spoken at all of the first mode; as this is so evident, that it does not require any strict examination, to bring the obstruction to the clearest view.

And this being the state of the question, I confess, that, when I read what Ruyfch replied in his own behalf (*g*); notwithstanding I thought myself much oblig'd, by the very great humanity which that excellent anatomist exercis'd towards me, I was, nevertheless, equally surpriz'd that I should have "seem'd" to him, "never to have seen, in my own anatomical inquiries," that coalition of the tube with the testis.

For I had seen it, and have even seen it since, as my letters to you demonstrate; and not only in old women (*h*), but in young women also (*i*): and sometimes in both of them on both sides (*k*); at other times on one side only (*l*). But I have other observations still remaining, two of which I will take the trouble to transcribe here.

26. An old woman having died from a blow on the head, her genitals, together with the urinary parts, were brought to me, when I was delivering my public lectures in the college, about the end of January in the year 1743.

The trunk of the aorta, where it descended betwixt the kidneys, had its internal surface very unequal on every side; from the upper part quite to the termination; and in a manner corroded, by reason of bony scales, which were so thickly strown, that the orifices of the lumbar arteries could not be known without difficulty.

And the tubes of the uterus were so grown to, and confounded with, the testes, which in other respects were not tumid; that one of them in particular, which was intirely without the fimbriae, could not at all be distinguish'd from the testis.

27. About the same time of the year, but in the year 1746, the genitals of a woman; who died, within about the thirtieth day after her delivery, of a slow fever; were brought to me to the same place, in as perfect a state as they could be procur'd.

For the testis, and tube, on the right side, were agglutinated to each other, and to the neighbouring intestinum colon, and, in part, already destroy'd by an abscess; which I suppose to have been the principal cause of her fever and death.

(*e*) Hist. Dissert. Foem. gravid. §. 2. not. *b*, & ad Praelect. Boerhaav. ad Instit. §. 668 not. *e*.

(*f*) Cent. Obs. Anat. Chir. 83.

(*g*) Advers. Anat. dec. 1. c. 2.

(*h*) Epist. 12. n. 2.

(*i*) Epist. 38. n. 34.

(*k*) Ibid. & Epist. 21. n. 47.

(*l*) Epist. 29. n. 14. & Epist. 26. n. 13.

The state of the uterus, such as was to be expected in a woman who had lately born a child, I shall describe in another place: it will be sufficient to remark, in this place, what seem'd to be morbid.

That is to say, some part of the corona of the os uteri, looking on it anteriorly, was of a violet-colour, inclining to blackness: but by cutting into it also, I observ'd, within the substance of its parietes, a blackness, as if from blood stagnating within the dilated vessels; from the orifice quite to one half the extent of the cervix.

Finally, the left testis did not differ in its colour, and magnitude, from any sound testis. Yet its substance was softer than usual, and when cut into more moist; so that it might seem to be made up of a kind of jelly as it were, rather than of any other substance.

There was no where any appearance of the corpora lutea, nor any vesicle; if you except a spherical little cell of the bigness of a small grape, empty, and made up of a thickish and whitish coat. Which cell, being situated under the very membrane of the testis, had given marks of its existence before the testis was cut into. For under an obscure kind of cicatrix, corresponding to that cell, something of a yellowish colour was seen to shine through.

28. I do not think that you will take an argument from this state of both the testes, and one of the tubes, in order to refute the opinion which is now embrac'd by most learned men; or at least a great number of them.

For you not only know, how easily arguments of this kind, which were formerly inculcated by Nabothus (*m*), and others also, are invalidated; but even others which are more difficult to appearance; as, for instance, when they object the case of a certain woman; who having been pregnant only for so short a time, that the foetus was scarcely equal to the length of a little finger; had, nevertheless, both of her testes in a scirrhus state.

For it is sufficient, that, when a woman conceives, no less a part of either testis is found, than belongs to one mature vesicle, or rather to one mature corpus luteum. And when this has perform'd its office, if itself also is vitiated by the extension of the disease, and degenerates into the nature of a scirrhus, as well as the other parts; it is no objection at all to the opinion in question.

And what forbids us to assert, that it may be vitiated within a few weeks, not to say within those nine months of utero-gestation?

For which reason it is the more surprizing, that there should have been any one, within this little time, who made objections to that opinion, from the tubes being found, by him, to be without fimbriæ, and the orifice, that is between these fimbriæ, to be quite shut up, in a woman who had born a child eight years before: as if it were necessary to believe, that the child was born while the woman was in this state; and not that she had rather been injur'd, in those parts, by a disease which was not of long standing: especially as "a certain pyriform bulb, turgid with whitish and fluid matter," which it is most probable was pus, occupied the place of the fimbriæ.

But "fictions help the understanding," says he, "though they do not demonstrate the truth of the matter."

Yet where there is no room for demonstrations, and the opinion, which is attack'd by arguments of that kind, is already very well supported by reasons, and observations; we must see what is the most probable, and agrees the best with these reasons and arguments, in order to reply to the objections.

And that you may perceive, how differently the thing appears to me from what it does to him; he thinks that not even eight years are sufficient to bring on disorders of this kind: but to me it seems that even the very time of a difficult birth is sometimes sufficient; provided the time of lying-in is not very happy afterwards.

For, in such a birth, the vehement and frequent strainings urge the gravid uterus (as I have already (*n*) hinted) against the testes, and the subjected tubes; which parts are press'd against the bones of the pelvis, and contract the beginning of an inflammation, which is soon after increas'd by the lochia, for instance, when they flow but very sparingly.

And I suppose these things to happen so much the more easily, in proportion as violent and frequent vomitings, during the course of the foregoing utero-gestation, have press'd upon, and shaken these parts; or some other causes have begun to injure them, and dispos'd them to contract the disease.

But omitting these things, let us return to the histories; and as I have hinted at some things, in regard to the peculiar disorders of the tubes, and in regard to those which are common to the tubes and the testes; let us now also say some things briefly, in respect to the peculiar disorders of the testes.

29. A woman, of about forty years of age, had been formerly attack'd with an apoplexy; which returning, at length carried her off. I was at this time giving the public demonstrations of anatomy, in the year 1725: but no other parts were brought into the college, beside those which are subservient to the offices of generation, and the secretion of urine.

The trunk of the great artery, where it lay betwixt the kidneys, show'd, internally, some very slight beginnings of bony scales. The kidneys themselves, which were not furnish'd with a very great quantity of fat on their external surface, were nevertheless stuff'd up therewith, to such a degree, betwixt the papillæ, that I never remember to have seen more.

Both the testes were contracted and lank; but the right by far the most so: and from thence an hydatid was prominent of the figure and magnitude of a chesnut, containing a brownish water within thicken'd coats; which were, on their internal surface, smooth and equal.

In the left testis a round cell was quite buried, not larger than a very small grape; being made up of white and thickish parietes, that were internally unequal, and contain'd a small quantity of humour.

However, in neither of them was there any of the natural vesicles.

30. As these vesicles are necessary to generation, whether they, as most persons believ'd, are eggs, or rather are chang'd into the corpus luteum; it is just the same thing, you see, whether they are perfectly wanting, or do not contain that fluid which they ought to contain.

Wherefore, it is not to be wonder'd at, if a woman; who was in other respects healthy, and young; and married to a young man of a robust constitu-

(*n*) Epist. 39. n. 38.

tion; in whom Vallisneri (*a*) found all the vesicles full of a turbid, and fuliginous matter, which had but little fluidity, was barren.

And there was great reason to fear, that another young woman; who died within an hour after her first delivery, in both of whose testes Alexander Bonis wrote to me that he had seen, with Santorini, a great number of vesicles of various magnitudes, containing a pellucid humour indeed, but in which a small white corpuscle was seen, which vesicle soever you examin'd; there was, I say, great reason to fear, lest this woman would have been barren, if she had liv'd.

And this observation of my most respectable friends, I have the more readily taken notice of to you; that you may perceive this to be the effect of disease, which some authors of note have consider'd as a proof of the vesicle being become fecundated.

31. How many observations of my own, of disorders in the testes of women, I might add to these besides; if I were not cautious of being too prolix; you will conjecture even from those things which I have formerly thrown out in the first of the Adversaria (*p*), in regard to the disorders of those parts; some of which I had found very rarely, and others very frequently.

And as many, in confirming the same things, have taken notice of this passage; so I do not know why but very few (among whom in particular was the celebrated Paitoni (*q*)) have shown that they had read the other passage, where, in the fourth Adversaria (*r*), I have said what I thought of the nature of these vesiculæ, and the corpora lutea, and their use, together with my reasons for my opinions; whereas many authors, nevertheless, since the year 1719, in which those things were publish'd, must have repeated the same things in their writings.

But to return to the first passage; they who have abus'd those observations of mine, or similar ones of other authors, so as to contend either that the testes are useless, or that women would for the most part be barren; either have not observ'd, that these disorders are not generally met with in the dissection of young and sound women, or that it is not necessary for conception, that every part of both testes should be sound; nor finally although besides the testes, there are so many other parts in women, which are themselves liable to diseases, and yet are necessary for the procreation of children, that it nevertheless does not happen very seldom, nor yet for the most part, nor yet from the same cause, that women either are actually barren, or become so; and that Hippocrates (*s*) had formerly said with great propriety: "and so many and various kinds of disorders happen to women, on account of which
" they do not bring forth, before they are cur'd of them, and many by which
" they become quite barren; that women need not be surpriz'd they do not
" bear children, though they have frequent commerce with man." Farewell.

(*a*) Ist. della Generaz. p. 2. c. 5. n. 14.

(*p*) N. 30.

(*q*) Della Generaz. dell' Uomo Disc. 3.

(*r*) Animad. 28.

(*s*) De Sterilibus n. 5.

LETTER the FORTY-SEVENTH

Treats of Disorders in the menstrual Flux, and of the Fluor Muliebris.

ALTHOUGH Bonetus has given a particular section to each of these subjects; that is the thirty-fifth, and thirty-sixth; yet I have more than one reason for comprising both these subjects in a single letter.

For in the first place, I have observ'd this circumstance, that if you take away the long and frequent scholia; and those frequently such as are quite useless, since more consistent doctrines have been taught in the medical schools; you will find that not many observations remain in those otherwise short sections.

In the second place, I have observ'd that there are some of these, as Bonetus himself confesses, which have been propos'd by him in other places; and even that there are some, which are repeated in one and the same section, without his being aware of it; as, for instance, in the thirty-fifth, the fourth observation is repeated, in the last article under the seventh observation, that is in article the tenth; and in the thirty-sixth section, you will find what is read under the first article of the first observation, repeated under the second article.

And these repetitions are so much the less tolerable, because either the history is imperfect in the second place, as in the second example; or even in both places, as in the first. Nor would I have you say that the readers are, in both cases, refer'd to the section intitled *de ventris tumore*, book the third. For we must turn over a hundred and eighty-six large pages, in order to light on that history at length; which begins in far different words, and is for that reason less easy to be found, under the fifty-fifth observation, in article the twenty-third: but even there it is not accurately copied, nor amended by any needful animadversions.

For the author of the history, I mean Dodonæus, in that very thirty-fourth chapter which is refer'd to, had said, that no excrementitious matter had been discharg'd from the uterus of this virgin, through the whole of the disease, notwithstanding the uterus was ulcerated; and that because "the hymen, which nature has granted to virgins, prevented the discharge."

But in the Sepulchretum, instead of *quod natura virginibus concessit*, we read

qui natura virginibus concrefcit. That is, if it convey any idea at all, which naturally grows together in “virgins.”

Yet read it which way you will, how do the menfes flow out in other virgins? And even in this very woman who was “fifty-five or fifty-fix years of age,” if they had not flow’d out before the difeafe; how could Dodonæus have omitted that circumftance?

Wherefore neither *quod natura conceffit* nor *qui natura concrefcit* can be admitted of.

Laft of all, I wonder that fome obfervations, together with their ſcholia; as that for inftance which we have in the thirty-fifth fection under obfervation the firft; do not, as the intention of the fection requir’d, relate to the cauſes of difeaſes; but to the natural ſources of the menſtruous blood: and that theſe, if you attend to the obfervations produc’d, are determin’d to be in the vagina: which indeed I have never denied; although it has never yet happen’d to me, to ſee them elſewhere than in the fundus uteri: nor can I lay any great ſtreſs upon ſome reaſons they make uſe of to confirm this circumſtance; as that, for example, which is ſubjoin’d in the ſcholium to article the ſecond of the firſt obſervation; I mean that “ſometimes cancers
“or ſchirri of the vagina come on: and that ſo much the more if the men-
“ſtrua are deficient; becauſe the blood which was wont to be purg’d off, is
“delay’d there for a very long time, ſtagnates and becomes of a hot nature:
“whereas thoſe malignant ulcers and tumours more rarely are form’d in the
“fundus and cavity of the uterus itſelf.”

For whether this, to take no notice of other things, does happen “more
“rarely,” the greater part of the obſervations in the next ſection will ſhow you.

But let us omit the conſideration of theſe things, and of the third obſervation which relates to the natural cauſe of the menſtrual purgation; with the very prolix ſcholia that are the conſequence of it; and bearing in mind the intention of this letter, firſt, in regard to the menſtrua, let us copy from the obſervations of Valsalva, thoſe things which relate to the morbid ſtate thereof.

2. A virgin who ſeem’d of a ſalacious diſpoſition, or was at leaſt very lively, had never yet had any menſtrual diſcharges, when ſhe died in the nineteenth year of her age. The uterus was very ſmall: yet the length of the fundus was not leſs than that of the cervix.

3. This is ſufficient to ſhow you, that the uterus had nevertheleſs increas’d more in this virgin, than in that woman whom I deſcrib’d in the former letter (a); notwithſtanding it was very ſmall indeed, and ſmall for that age: and this obſervation will confirm the conjecture I made in regard to the former woman, that ſhe had never been menſtrually purg’d.

For it may excite a ſuſpicion in us, whether the appearance of the menſtrua, in ſome virgins, who are in other reſpects healthy, full of alacrity, and have attain’d to a proper proportion of body; when it happens ſome years later than it does in general; whether, I ſay, this appearance ſhould not be aſcrib’d, ſometimes, to the very ſlow increaſe of the uterus.

For I knew a noble virgin; that is to be number’d in the claſs of thoſe of

whom I have been speaking; who, being married before her menses, which had been expected for some years, appear'd, was nevertheless very fruitful: and that we may the less be surpriz'd thereat, the very same thing had likewise happen'd to her mother.

And without doubt, it is much better, where the young women are in good health, to wait and do nothing; as I did in that case; lest by our inopportune remedies, we perhaps cause a delay in the work of nature, which she performs later in some than in others.

4. Another virgin, who had now been without any menstrual purgation for many years, and had been long troubled with ulcers in the tibia, died in a tabid state.

In the thorax, and belly, was a stagnant water. The testes were without any vesicles, and consisted of a substance of a whitish colour; which bore a resemblance to the pancreas, but was of a softer nature. On the internal surface of the uterus were a great number of glandular bodies protuberant; except that in the upper part of the fundus there were but few observ'd.

5. This, you see, is another example, that may be objected to some physicians, who are too busy in bringing on an appearance of the menses. For they do not consider how various, and different from one another, the causes of their not flowing may be; and immediately have recourse to such things as excite them: as if the uterus itself were always sufficiently prepar'd to transmit the flux which they provoke.

Therefore they frequently increase the cause of the disorder, instead of removing it.

These remedies succeed very well, in most of those persons where the blood is viscid, or inert from too great a quantity of serum; as I have, for the most part, seen this to abound in blood that has been taken away by venæsection; the remaining part being generally contracted into a cylinder, of a more slender shape and consistence than usual; when this purgation was wanting: either wholly, or in great part: and indeed I have observ'd the same, even in a certain woman whose menstrua had been accidentally suppress'd, in the middle of their course, by a fright; though this had happen'd only five or six days before.

But how can these remedies have a good effect, not only when the blood is, on the contrary, of a more hot disposition, or in greater plenty in the constitution; but when the blood itself is in a proper quantity and state, and the uterus is, nevertheless, very dry, and contracted; or, which you may suspect from certain long-continued disorders, as in the virgin in question, affected with some organical disease?

Without doubt it is more proper sometimes, to moisten and relax; and at other times to resolve diseases, as far as this can be done.

I knew a physician of eminence, who was accusom'd to use the filings of steel, mix'd into a pillular mass with aloes, ammoniacum, and the concremented juice of succory; adding moreover, when he thought the force of the medicine needed to be increas'd, a little dittany of crete, myrrh, and saffron: and of the pills made of this mass, he, in general, gave two before a sparing supper; but in the morning he gave broth, medicated with herbs, and roots, that might have the power of softening and opening: and by these remedies

he

he said he always saw the wish'd-for effect; provided a proper regimen of living was observ'd at the same time.

There is no doubt but this physician; whose remedies I have taken notice of, not because they are not in the number of the most common, but because some are endow'd with different virtues from those of others; might often bring about what he had undertaken; yet he would better have effected his intention, if it had been in his power to know, what it was necessary to do in the cases of particular women.

For one remedy alone, if more suitable than the others, has the desir'd effect sooner, and more to the purpose.

Thus I likewise know another physician, who, when he sees that there is room for aloetics, gives every day nothing more than a few grains of aloes, wrap'd up in any thing that can obtund the sensation of bitterness; and says that with these alone he more successfully recalls the menses, than by giving many more grains, or other remedies at the same time with them.

And in regard to a proper method of living, which, as I have said, is not to be neglected; this is so much the more certain, as it is more evident, that the menstrual purgation is very much diminish'd, and sometimes suppress'd, by errors in the diet, exercise, and the like.

Thus, to illustrate the modern errors of some women, by an ancient example; Galen (*b*) has deliver'd down in his writings that, at Rome in his time, "it had happen'd that, as women in common drank the coldest water " from dissolv'd snow, they either had no menstrual purgations at all, or at " least had them only in a small degree."

6. But to return to those remedies which excite the menses; it sometimes happens that there is no room for them, either at present, or in future; as, for instance, when the uterus is affected with a disorder of such a kind, that it cannot be remov'd.

Let us take an example of this kind from the very experienc'd Benevoli (*c*).

He discharg'd, in four virgins, by means of chirurgical remedies, the menstrual blood which had been retain'd in the cavity of the uterus. The three first of them had blood discharg'd from the uterus, every month afterwards, according to the ordinary course of nature.

But the fourth had no discharge of the kind, even eight or ten years after; all the endeavours of physicians to procure them being in vain. Why so? Without doubt because this last had not had the blood confin'd, for only a short space of time as the others had, but for the whole space of three years; so as to be now increas'd to the quantity of two and thirty pounds, and to have much purulent matter mix'd with it.

It was probable therefore that the internal surface of the cavity of the uterus; being injur'd, and cover'd over with a cicatrix; had no longer the orifices open, by which the blood is, at stated times, discharg'd.

What, then, can we expect, in this, or any other similar case, from such remedies as provoke these discharges, but to add disorder to disorder? Let

(*b*) L. de venæ sect. advers. Erasistratæos c. 3.

(*c*) Osservaz. 1.

such women as these use a sparing diet, and lose blood, by venæ-section in the arm, when there is occasion.

7. But now, as I have enter'd into a discourse, which I know to be very pleasing to you, relating to the methods of curing, by medicine, suppressions, or obstructions, of the menstrual blood; before I go on the anatomical histories of the contrary disorder, I will take the trouble to subjoin the method to which that industrious, and experienc'd man, Zanichelli, trusted greatly in counteracting this second disease.

He order'd snails, of that small and whitish kind, which are found upon the *carduus stellatus*, to be bruise'd in a mortar, together with their shells; adding a little quantity of the conserve of violets as it is call'd; after which they were hung up in a linen cloth, and the descending liquor receiv'd even by the help of compression.

Of this liquor, when fresh-made, he ordered three ounces to be drunk every morning; and the same quantity at noon before dinner; and in an evening likewise before supper; when he suppos'd this too great discharge of blood, from the uterus, to proceed from that fluid being in a dissolv'd state; and impregnated with irritating particles.

And he affirm'd that this liquor had answer'd so well with him; and had produc'd so good effects; that he had even transferr'd it to the restraining of bloody discharges from the chest, if these happen'd from the same causes; nor would he commit this secret to me, on any other condition, than upon promising that I would reveal it to no person, as long as he was living; and this I have perform'd.

The following relation I also receiv'd from him: a woman having labour'd seven years under an uterine hæmorrhage, and all other remedies being in vain; she was perfectly and happily cur'd by him, by means of giving the juice of lemons, and an equal weight of spirit of salt. And he had been induc'd to give these remedies, because he had conjectur'd that there was a kind of scorbutic state of blood in this woman; and because he had before experienc'd how much it had been of advantage to others, to hold this liquor in their mouths, when it was considerably eroded by the scurvy.

From these cases then; which I relate to you, just as he related them to me; it appears that in this disease, as well as in others, the conjecture of causes is of great importance: nor can the same remedy be proper for all.

But sometimes there is no room for any remedy, except in the beginning; as you will understand from that history, which I shall here annex, from *Val-salva*.

8. A woman, of one and fifty years of age, had begun, five or six years before, to be troubled with a considerable profluvium of blood from the genitals: so that coagula of blood were discharg'd which weigh'd half a pound; other lesser coagula following them.

A serous colluvies was also discharg'd sometimes, and, at others, a humour like water in which fresh meat had been wash'd.

If this flux was at any time suppress'd, she was troubled greatly, above other symptoms, with a violent pain, and sense of weight in the hypogastrium; till she was reliev'd by the returning flux.

To these disorders was sometimes added a difficulty of making water; which fluid was at length discharg'd, after some considerable efforts, together with a fœtid blood, and putrid filaments.

Moreover, the woman was seiz'd, on both sides, with an ischiadic pain; which was so raging, in the night time in particular, that she could scarcely get a short sleep. Then hysterical convulsions attack'd her with so much violence, that she seem'd, more than once, to be at the point of death.

To these succeeded a tumour of the whole belly, with a very great dryness of the fauces, a frequent eructation of flatus, and an aversion to food for this reason; because even when she had taken a little, a tension was immediately perceiv'd at the region of the stomach, which gave her great uneasiness.

These symptoms, and vomitings, never left the woman even when the other disagreeable symptoms were at length appeas'd. And indeed about two months before her death, the vomiting, which us'd to trouble her but seldom, became frequent; but in such a manner at first, as to oblige her to throw up nothing but eggs, which were her usual food; the other things, that she took with them, being perfectly retain'd; and after this so, that, for the last twenty days, she scarcely retain'd any thing of aliment that she took; let it be what kind soever: wherefore her strength decreasing every day, she departed this life.

In her carcase; which was so emaciated, that even the muscles were almost without flesh, as it were; scarcely any traces of blood remain'd.

The whole belly was fill'd with a salt serum, in which some portions of the omentum, and a great number of filaments of other kinds, were floating. The internal surface of the peritonæum every where show'd little bodies, that bore a considerable resemblance to the indurated glands of the pancreas. The stomach was small and universally contracted.

The kidneys, as far as relates to their substance, were found. But the right contain'd very small calculi, of different forms; none of which were in the left. Both the ureters contain'd urine; the left a little only: but the right being dilated to the thickness of my little finger, was universally full of urine.

Finally, there was a fordid and fœtid ulcer in the collum uteri; though the uterus was, in the rest of its parts, in a natural state.

9. Whether the ulcer was the effect of the profluvium of very acrid blood, or whether it was the cause of it, from the very beginning, by corroding some of the more considerable vessels; the disorders that were afterwards added to the ulcer, and profluvium, may be easily accounted for from the nerves being drawn into consent, by reason of the situation of the ulcer; and from the blood, by reason of the great and frequent loss thereof, being ill repair'd, and therefore render'd serous.

For from the one would arise pains, hysteric convulsions, and vomitings; and from the other, or rather from both the causes when join'd together, an ascites; the vessels, for instance, being frequently constricted by the convulsion, and the blood for that reason slowly circulated through them; and the serum, with which the blood abounded, being more easily effus'd.

But the difficulty of making water, and the discharge thereof not till after many attempts, we may account for, from the pain in the neighbouring ulcerated part, and the state of that part; the retention of urine in the uterus, and the dilatation of the right in particular, from one of those stones which had been in the kidney of the same side, and perhaps a pretty large one, having fallen into it, and been confin'd there; and yet, among so many other pains, and uneasinesses, not observ'd when discharg'd, nor taken notice of afterwards in the urine, which was foul with the same kind of putrid and bloody fordes, that cover'd the whole pudendum.

10. If after the observations of Valsalva you also desire to have mine; read over again what I have describ'd (*d*), in the uterus of those women who had died with their menstrua either diminish'd, or flowing in their full vigour. For I will not repeat them here.

But I will rather pass over from the last propos'd observation; of a profluvium not only of blood, but of a serous colluvies also; to the fluor muliebris, which was a second subject of this letter.

To which disease although I have no observations of Valsalva's peculiarly relative; yet there are so many of mine remaining; especially if I should be willing to pursue the beginnings of some of the causes of this fluor, observ'd by dissection; that I am under a greater danger of exceeding, unless I am cautious, than of not filling up, the bounds which I generally prescribe to my letters.

11. The sources of the fluor muliebris are, for the most part, in the uterus. For that which we read in the history of the Royal Academy of Sciences at Paris (*e*); that from a large abscess of one of the ovaria, with which the tube communicated, a purulent serum had flow'd down into this tube; from thence into the uterus; and at length from the uterus into the vagina; is rare.

But the uterus itself is the source, either of a various-colour'd, a simple, or a purulent serum. And the latter flows from the uterus, or the vagina, when ulcerated.

Yet the former is generally from the uterus, the internal membrane of which, like that of the nostrils in a coryza, may be affected with a kind of rheum; or the mouths of the small vessels may so far contract themselves, after having discharg'd the menstrual blood, as to prevent any farther discharge of this fluid, indeed, but not of the serum; in regard to which, as it is ting'd with a different colour, in different persons, so it does not make a fluor of the same colour in all.

And these things I have hinted at in the *Adversaria* (*f*).

Of this rheum of the uterus, eminent physicians have expressly spoken, before the more modern; and among these Gulielmus Ballonius (*g*), who call'd it a "catarrh;" and Lælius a Fonte (*b*), who call'd it "a distillation of the uterus," and said that it was "a kind of rheumatism; and before them Galen (*i*) formerly, who has taught us, that these fluors are produc'd "by rheums of the uterus."

(*d*) Ep. 19. n. 11. Ep. 21. n. 29. Ep. 31. n. 16. Ep. 38. n. 34. Ep. 45. n. 21.
 (*e*) A. 1700. obs. anat. 5.
 (*f*) IV. Animad. 27.
 (*g*) L. 1. Consil. Med. 56. sub. fin.
 (*b*) Consult. Med. 117.
 (*i*) De Symptom. Caus. l. 3. c. 4.

I, however, will first propose the observations, that are to be refer'd to those which are brought on in the first, or second method; or a third which I shall add (*k*); and consist of a simple serum: and then I shall give the observations that relate to fluors, which have their origin from a purulent serum.

12. A virgin about sixteen years of age was brought into the hospital of St. Mary de Morte at Bologna, after having been afflicted for fifteen days with a fever at home. She was no sooner brought in, but she vomited worms; one of which was of a red colour, longer than a span, and almost of the thickness of a common writing quill.

These animals she had also brought up at home; the discharge being preceded by a gushing of tears, but not by an itching of the nostrils. She complain'd of a pain, the seat of which she pointed out, by applying her hand to the left hypochondrium, and the neighbourhood thereof; in such a manner that it could not well be ascertain'd, whether she meant to mark out her belly or her breast.

Her pulse was frequent, small, and weak. She often slept in the daytime. In this manner she pass'd three days. At which time, besides the other symptoms, the women who were about her, observ'd that there was a fluor albus also.

On the fourth day she seem'd to be frequently delirious. The pulse was become weaker, and smaller. The tongue was red and dry. She complain'd of a pain in the head.

On the fifth day she was very prone to sleep; but on the following night she cried out very much.

On the sixth and seventh day the same symptoms continu'd: and she then discharg'd her urine, which she had always discharg'd pretty freely, and in a large quantity, involuntarily, and in a very great quantity.

On the eighth day after her first coming into the hospital, being overcome with sleep, she died.

We dissected her body on the second day after her death; which day was the thirtieth of March in the year 1706.

When the cranium was open'd; for from thence I choose to begin the narration of those things which we saw; whatever is contain'd in the meninges was of a very soft nature. Betwixt the pia mater, and the whole basis of the medulla oblongata, was a considerable quantity of water: and within the ventricles water was also found, which was of a reddish colour.

The *plexus choroides* were of a pale colour: but the vessels which crept through the whole pia mater, and those also that went through the surfaces of the lateral ventricles, were turgid with blood: and from the same ventricles, these vessels were very easily pull'd away, together with that membrane; which was follow'd by a lamella of the white, or cineritious substance, that compos'd their parietes: and this lamella was, in every part, nearly of an equal thickness.

The thorax had both lobes of the lungs, but especially the left, adhering

to the pleura in some places ; both at the middle and at the lower part ; and that by means of membranes interpos'd.

Looking upon the surface of the right lobe, at the upper part, and seeing, through the investing membrane, certain globular bodies lying very thick, and not larger than millet-seeds, I cut into these lungs which were in other respects found ; and found the same globular bodies lying every where very thickly indeed, but disjoin'd from each other by intervals ; being hard in their substance, and, to appearance, of a tartareous nature as it were.

In the heart was nothing worthy of remark ; although, in the right auricle, a polypous cortex of grumous blood cover'd the side thereof.

In opening the abdomen ; which had appear'd livid, externally, towards the ilia ; we had seen the liver to be ting'd, at the middle of the lower convex surface, with a spot of no very large size, comprehended in the circumference of a circle ; being of a cineritious colour inclining to white : which colour descended into the substance of the viscus. In the vesicle the bile was inclin'd to a black colour.

The flat surface of the spleen was also of a livid colour inclining to blackness ; tho' this blackness was scarcely produc'd farther than the coat of it. The pancreas seem'd to be somewhat hard. The stomach, as far as I could judge externally, was found. We perceiv'd round worms to be harbouring themselves in the small intestines, by feeling them with our hands.

Then turning our eyes to the appearances in the pelvis, we observ'd a small quantity of water there. But upon taking out the bladder (which was distended with urine) together with the annexed genitals ; we saw, on the internal surface of this cavity, the small vessels tumid with blood for a considerable tract ; so that beginning above the orifices of the ureters, through which they were continu'd, they exhibited this appearance quite to the beginning of the urethra : and indeed betwixt these vessels, in some places, we saw drops of extravasated blood through the internal coat ; and in the urethra itself, beneath the internal membrane, which was sprinkled with its small vessels, were others much larger than these, and very much distended with blood.

The left of the nymphæ, which was broader than that on the right side, was likewise longer than that, to such a degree, as to reach to the frænum of the labia ; having a water contain'd within its substance.

Moreover, the orifice of the vagina, and the hymen, were of a red colour degenerating into blackness ; and smelt very strong : and the neighbouring part of the vagina, being here and there of a livid colour inclining to yellow, gave pretty considerable marks of a gangrene.

Turning from these lower parts to the upper, I observ'd the wider extremity of the left tube to be drawn downwards by an hydatid ; equal in size to a large grape ; which had been form'd in the contiguous part of the ala vespertilionis.

But that a larger hydatid than this, had been pendulous from the membrane of one of the testes, I perceiv'd from a roundish corpuscle ; which, although it was contracted into itself, yet even then preserv'd a small cavity betwixt the thicken'd coats, and hung from this testis.

And in this testis were two roundish bodies buried ; the one bigger than the other, but both of them made up of a black coat, and of a kind of coagulum

agulum of blood shut up therein ; which, however, was of a red colour. The other testis likewise contain'd two unequal cells, form'd of a black coat, but empty.

The uterus was small, and consisted of parietes of an inconsiderable thickness. The upper part of its fundus was universally red with conspicuous blood-vessels, on its internal surface. When I had wip'd off the mucus, which we see there in a natural state, from the osculum uteri, and the neighbouring part of the cervix ; by compressing the inferior part of the fundus, the cervix, and the corona of the os uteri, I saw a thickish, and pretty white, matter proceed from all these places ; and that in a regular manner ; which pretty clearly shew'd from whence the fluor albus had been discharg'd.

13. The other parts of this history you will, of yourself, refer to the classes whereto they belong ; for I am not willing to speak over again here, of the disorders whereof I have sufficiently treated already.

It will be enough for us to attend to the last part : nor would I have you believe, because I have said that a white and thickish matter was press'd out, that this was any thing else but serum ; which, having lost its other, and more watry, particles, by stagnation, and by being taken back into the blood, the remaining particles become endow'd with that colour, and thickness, which we see in the evaporation of the serum.

14. A virgin, of fourteen years of age, having died in the hospital at Padua, about the beginning of February in the year 1719 ; after labouring under pains of the belly ; I order'd the genital parts to be brought to me, for the sake of anatomical researches ; and as I found some morbid appearances therein, contrary to my expectation, I will relate them to you ; after having first pointed out two things that were observ'd in the belly, while these parts were taken out.

The viscera of that cavity were here and there unequal with tubercles. The omentum was thicken'd, and adher'd to the fundus uteri. This last-mention'd part was still very small ; being such a one, for instance, as was proper for a girl, whom, if you consider'd the pubes as yet scarcely furnish'd with any hairs, you could scarcely suppose to be at the age of puberty.

When I had cut into it, I found the cavity full of a humid matter, of a white colour ; but inclining to a yellow and greenish hue. And this being wip'd off, the internal surface of the uterus appear'd to be growing out, in several places, into small whitish tubercles.

Moreover, there was no protuberating corona to the os uteri : and this orifice, and the neighbouring part of the vagina, and the lower part of it likewise, and the hymen, were occupied by a phlogosis ; so as to make it natural to conjecture, that these inferior parts had been irritated, by the flowing down of the more fluid, and acrid part, of that matter ; while the more thick part, stagnating in the uterus of the virgin, when in a recumbent posture, adher'd to those small tubercles, which either this matter had produc'd, or from which, perhaps, this matter had proceeded.

15. Call to mind another young woman, the internal surface of whose fundus uteri I likewise have describ'd (*l*), as unequal with certain tubercles, like warts ; and you will readily conceive that this surface is prone to disorders of

that kind: and the same will be confirm'd by the excrescences of which I shall speak hereafter.

But do not be surpriz'd, that there should be a fluor muliebris in a girl of this age. For in many it has begun about the first dawns of puberty; and in some even much sooner, though rarely; in the same manner as the menstrual flux is observ'd rarely, but in fact much sooner.

Read in Terraneus (*m*); to take no notice of others; the observation taken from a girl of nine years of age, of a noble family, who was cur'd of a fluor muliebris; and even an observation of another, who being younger than the last by two years, was affected with the same disease, and "discharg'd, in "great quantity, a humour like whey not yet clarified: and this with some "ardor, and pruritus."

16. As I was demonstrating some of the parts of an old woman, who had died in this hospital of I know not what disease, before the middle of December in the year 1744, to the students therein; I happen'd to light on some appearances which were preternatural.

The valvulæ tricuspidæ of the heart were pretty hard here and there; nor were the femilunares without some hardness. And indeed the great artery had bony scales internally, in several parts.

To the testes some hydatids adher'd. When I had brought the os uteri to view, by laying open the vagina; the border of it appear'd to be divided into two parts as it were, from the anterior to the posterior view.

That is to say, from each side of that border, a small excrescence was protuberant; in which, as in the neighbouring parietes of the cervix also, lay hid some cells, or if you please, vesicles; and among these, one pretty large; all of them being full of that very mucus, which is naturally wont to be found at the orifice of the uterus; except that this was of a yellow colour.

While I went on in cutting into the cervix, and proceeded upwards, behold from the very fundus uteri suddenly issued a yellowish serum; and this in such a quantity, that you could scarcely have held it in a spoon: but how this serum was retain'd in the fundus, even when the uterus was taken out, and roll'd here and there, it was not very easy to conjecture.

For in another woman, when the same thing occur'd, I could suppose, that the internal fasciculi of the cervix; which I saw to be thicken'd, and plac'd in a confus'd order; had obstructed the deflux of the serum.

But this circumstance did not take place here: and the upper part of the fundus, almost universally, especially on its posterior part, being ting'd of a filthy colour internally, was, externally, of a black colour inclining to red; yet this penetrated but to a little depth if you cut it, and was without any ill smell.

17. To this class you may also refer the observation on the woman, which I have given you in the forty-fifth letter (*n*). For in that the cavity both of the fundus, and of the continued cervix, was full of mucus of a thinner nature than that which generally is at the orifice; and even was in this woman.

That is to say, as from the fundus uteri; in the virgin, and old woman, whom I have describ'd; a matter of a white colour degenerating into yellow,

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and a yellowish serum was discharg'd; so likewise in that woman, the thin mucus seems to have been discharg'd from the same place: for it did not come from the tubes, which I examin'd in all of them to no purpose.

But in the virgin; whom I put down in the first place (*o*), for this reason, beause a fluor had really been observ'd in her while she was living; a white matter was press'd out, not from the fundus uteri, but from the lower part of it; from the cervix, and from the orifice.

And from these inferior places, I suppose the matter, and humour, to have flow'd down in those women also; one of whose histories I shall immediately subjoin, and take notice of the others.

18. I examin'd the viscera of the abdomen of a certain woman, after the middle of March in the year 1741, in the hospital, and that for the sake of the anatomy of the parts: for which reason, I have not made any remark, in regard to the disorder of which she died. Among the natural appearances I observ'd the following preternatural ones.

The stomach extended itself quite to the navel. The intestinum duodenum was very wide. The whole of the uterus was so drawn to the left side, that it could not be drawn back into the middle with the hand, on account of the resistance given thereto, by the ligamentum latum; which was much more short betwixt the left side of the uterus and the pelvis, than betwixt the pelvis and the right side.

The internal surface of the fundus was ting'd almost of a bloody colour, as the corona osculi was also; except that it here inclin'd more to blackness. Besides, this corona was divided into two small prominences as it were. From the os uteri, and from the cervix, came forth a mucus; not of the same kind which we generally see, but thick, and almost puriform.

19. To this class, in my opinion, are to be refer'd those things, which, as I have written to you on other occasions, were observ'd by me in other women (*p*); and also in a certain virgin (*q*). For in the strumpet, I saw the osculum uteri daub'd over with a certain white and thickish humour; not only unlike that which was in the tubes, but also much unlike the semen virile.

And in another woman, in whom the corona osculi, and the vagina, were daub'd over with a whitish matter; this could not have any higher origin than from the osculum uteri: for the matter which I observ'd above the osculum, was quite of a different nature.

But in a virgin, whose vagina was more moist with a whitish and thickish humour, the dissection of the upper parts shows it to have come either from the same corona, or even from the vagina itself: nor does it seem that it could be accounted for from any other part, in another woman of whom I shall write on a future occasion (*r*).

Moreover, in the corona, osculum, and neighbouring cervix, that vesicles are sometimes prominent, and sometimes lie hid; which vesicles naturally contain nothing else but a limpid mucus, that may be drawn out into threads, such as is seen to be pour'd out at those places; you very well know from those things which I formerly advanc'd in the *Adversaria* (*s*), and at the same

(*o*) *Supra*, n. 12.

(*p*) *Epist.* 26. n. 13. & *Epist.* 21. n. 47.

(*q*) *Epist.* 34. n. 33.

(*r*) *Epist.* 50. n. 51.

(*s*) *L.* n. 32. & *IV. Animad.* 39. & 40.

time confirm'd: of the fortuitous formation of which vesicles, there is no occasion here to refute the figment of a modern anatomist; as it has already been refuted by others.

But what forbids us to suppose, that, as we see in other glands, so in these, also, by the force of disease, instead of that mucus a different matter may be separated; sometimes whitish, and thickish, and sometimes even watery?

And indeed, when you read the writings of those who had seen vesicles, in these situations, before me; you will find that the greater part of the observers, as I have said in the first of the *Adversaria* (*t*), had taken them for hydatids, from that water which they happen'd to find preternaturally contain'd in the vesicles. And that this water has been sometimes found by me also, for the same reason, in those vesicles; you sufficiently learn from the fourth of the *Adversaria* (*u*).

Therefore, as they naturally pour out that mucus; so when the secretion they perform is become vitiated and preternatural, they may pour out both a whitish and thick matter, and a watery matter.

20. But as not only in the lower part of the uterus, but even in the fundus itself, we have seen vesicles; though more rarely; having the same mucus in them as at the os uteri; a fluor of a watery, or thick and white matter, or finally a fluor of any other colour, may have that source in the fundus also.

And it behoves us here to confirm, by observations, what I say I have more rarely seen; especially as these relate to the excrescences of the uterus, of which it follows next in order to treat.

To the observation therefore, which you have had in the thirty-fourth letter (*x*); of an excrescence that was cover'd with vesicles of this kind, near the upper part of the fundus; and to another which you will have when I treat of lameness (*y*); of a tubercle in the upper part of the fundus, which consisted of a congeries of those vesicles; add these that follow.

21. The urinary and genital parts, of an old woman, were brought to me, when I was teaching anatomy in the college, in the month of February and the year 1740.

While I examin'd these parts, I observ'd that the trunk of the aorta was not without the beginning of bony scales internally; although they were very few, and appear'd like spots.

The fundus uteri being open'd; not only where it was nearest to the cervix did I see vesicles, but a little higher, also, from one side of it, I saw a small cluster, as it were, of these vesicles hanging down; which vesicles were connected one to another by a whitish substance being interpos'd: from whence a stalk also was form'd, not very short nor slender; whereby the cluster was connected to the internal membrane of the uterus, which was found, and consisted of the same whitish substance.

22. But as these vesicles themselves; except that they had formerly been torn from the membrane of the uterus, by I know not what accident; and their mucus were quite in a natural state; in order to convince you from observations, that the mucus which they contain may sometimes degenerate from its natural state (as I have hinted above) either in colour or consistence;

(*t*) N. 32. modo indicato.

(*u*) Animad. 40. indicata.

(*x*) N. 33.

(*y*) Epist. 56. n. 20.

first call to mind, that, when from the osculum uteri, two excrescences, as I have related a little above (z), made up of these vesicles were prominent, the mucus in these very vesicles was of a yellow colour; and then read the two next observations.

23. I dissected with accuracy, after the middle of March in the year 1717, the genitals of a virgin of three and thirty years of age.

The uterus, like most of the other parts, preserv'd its natural state. For although the vessels about it were very tumid, and the internal substance of it likewise turgid with blood; yet that these appearances were owing to the menstrual flux having been at hand, when the woman died, was plain from the internal surface of the fundus uteri; which, when the fingers were press'd underneath, emitted drops of blood, whereto, when wip'd off, others succeeded: but this was attempted in the cervix and vagina to no purpose.

At the same time that I was making these experiments, and demonstrating the event thereof to those who were present, I observ'd two excrescences; the one in the right side of the fundus nearest to the neck, the other a little below, in the same side of the cervix.

Both of them were small, and made up of similar vesicles. But upon cutting into them, those which compos'd the inferior, gave out a natural mucus; and those that compos'd the superior, a limpid water.

24. A woman, of seventy-five years of age, was seiz'd with an apoplexy when she seem'd to be very well in health; and by that was carried off within three days. The abdominal viscera were the only parts which were brought into the college, when I was teaching anatomy in February of the year 1735.

There were some glands of the mesentery (not only far from the annex'd intestines, but particularly more near, where three or four were nigh to each other, but not contiguous) which being of a natural colour and appearance, did not each of them equal the size of a small bean: this appearance, in a woman of that age, will perhaps seem surprizing to some persons, and perhaps also preternatural.

That the appendicula vermiformis was hollow only for a third part of its length, and scarcely that, I have sufficiently shown in the *Epistolæ Anatomicæ* (a).

This one circumstance I ought not to omit here; I mean that, from the corona of the osculum uterinum, an excrescence hung into the vagina, of the bigness of a very small cherry; being blackish and tuberosous on its external part: in cutting into which I found it to be nothing else but a congeries of vesicles, of a somewhat larger size; some of which contain'd that mucus whereof I have frequently spoken, in a natural state, and some contain'd water.

25. You see that the same vesicles may secrete that mucus, when in their natural state, and may also secrete different matters; and among these water; if they happen to be vitiated: and that either in the fundus uteri, where they are more rarely seen, or in the cervix, and osculum, where they are seen much more frequently.

And to the corona of this osculum; from whence I saw that excrescence consisting of vesicles to hang; perhaps belong'd that large tumour

(z) N. 16.

(a) *Epist.* 14. n. 62.

“ fill'd with watry cells in several places,” which Ruysch (*b*) describes as being cut out from the genitals of a woman; as it was a tumour which “ had its origin from the confines of the os uteri, or about the os internum “ uteri.”

But the fluors, of which I have hitherto spoken, all consist of simple serum. And some of these I have known to be got rid of by different methods; and that not very seldom; or at least to be vastly diminish'd: and I have known one, which from white became yellow, and obstinate to be remov'd, carried off, by a drink in which the herb sopewort was fresh boil'd, being given for many days; together with the use of white amber also, and the drinking of wine in which a small quantity of sarsaparilla root had been infus'd.

We must now go on to those fluors, in which a purulent serum is discharg'd. In regard to which, if, as is generally the case, they are the effect of an ulcerated cancer of the uterus, they are incurable even from the beginning.

And indeed I remember that when I, and a senior physician of no inconsiderable fame, consulted together on account of a noble young matron who was his patient, and afflicted with this disorder; with which she had been seiz'd no more than two months before, tho' it was now exceedingly violent; the senior physician made this conclusion to his speech: that the disorder indeed was violent; but yet as it was recent something might be expected from remedies: yet I immediately spoke to this effect, after saying something of the nature of the disorder, that the very circumstance which left him some hope, intirely took it away from me: for a disorder of this kind, which had made such a very great progress in so short a time, shou'd by that very circumstance, if it were not certain that it was incurable even from other symptoms, that it would prove unconquerable by all kinds of remedies.

Nor was I deceiv'd in my opinion; the woman being soon after carried off by her very severe and excruciating pains, by continual watchings, and a continual flux of a sanies, serous in its consistence, and brown in its colour; and of a very intolerable smell; and by other severe symptoms, which Aetius (*c*) formerly deliver'd at large from Archigenes: and before him Paulus (*d*).

In copying of whose prolix passage upon these symptoms, Frederic Hoffmann (*e*) forgetting, which is not to be wonder'd at in those who write a great many things, that it was from Aretæus, has said in the second book and the sixty-seventh chapter; which chapter is no where in all Aretæus: who gives you the marks of this disorder, in the eleventh chapter of the second book, of the signs and causes of chronic diseases.

Hoffmann says in the same place, “ that the more modern physicians have “ not much observ'd this affection of the uterus; but that he had observ'd “ it sometimes, just in the same manner and with the same symptoms as “ are produc'd in that passage, which I have refer'd to in Paulus.

Whether they have observ'd it little, or not, you will judge by their writings. To me however, it has been frequently seen; more frequently than I could wish; not only because it is incurable, but because in some patients it

(*b*) Thef. Anat. 8. n. 102.

(*c*) Tetrab. 4. ferm. 4. c. 94.

(*d*) De re med. l. 3. c. 67.

(*e*) Medic. Rational. tom. 4. p. 1. f. 2. c. 10.
in Thef. Patholog. §. 8.

scarcely admits of any alleviation; in whom I suppose it affected the vagina most: for these women having a few ounces of new milk, in which a little of any composition of opium was dissolv'd, thrown up into the intestinum rectum in the evening, obtain'd a very short, indeed, but a very desirable repose.

Yet there was one of these to whom it was of no service in the beginning of the night, but the next morning; and that constantly. If to the same patient opium were given, she obtain'd a remission of her pains indeed, and got some sleep; but this was succeeded by such a stupor of the senses, that the patient greatly complain'd thereof.

The symptoms however, in respect to the fluor, which we chiefly pay regard to here, are sometimes in part various. Read the observation of de Graaf (*f*) join'd with a dissection, which I am very much surpris'd to find omitted in this thirty-sixth section of the Sepulchretum.

You will see that a very acrid matter; but of the colour of the white of an egg, when "coagulated," had descended into the vagina from the uterus, which was, "every where, either ulcerated or scirrhus."

Or read over again the history that I have describ'd to you in the thirty-ninth letter (*g*). You will find that a very large scirrhus, in the cervix uteri, and almost the whole vagina, was ulcerated in such a manner, that, from certain parts of the ulcer, a white matter might flow down; but that no disagreeable smell was perceiv'd from ulcers of that kind, even the largest and most deep.

26. I should gladly have defer'd that history, wherein we treat of these things which I just now took notice of, after a profluvium of blood; the fluor muliebris, and the marks of an ulcerated cancer in the uterus; if I had not been under a necessity of producing it among those of internal tumours of the belly.

Other observations of mine, of erosions in the genitals of women, would have place here also; if it were not more proper to reserve them to another occasion (*b*).

In the mean while, I will point out to you some observations of others, which, if you please you may add to the Sepulchretum. In reading over these, you will find, that, in all of them, after uterine hæmorrhages, and purulent profluvia, suppurated tumours, or ulcers, were found in the uterus.

Thus Maximilianus Preussius (*i*), among the cysts which fill'd the uterus of his wife, describes such as "resembled abscesses fill'd with a purulent ichor, of a green colour mix'd with white, and extremely fetid;" and in them one which "had, in several places, perforated the urinary bladder, that was coalesc'd into one viscus, as it were, with the uterus all round about; and, together with the urine, had frequently discharg'd a similar pus from the body;" wherefore the pus did not flow out of the uterus only, but from both places, though generated in the uterus.

So Jo. Maurice Hoffmann (*k*) saw "the internal cavity of the uterus mark'd out into a great number of small caverns, and loculi;" after wiping off the pus wherewith the cavity was turgid. So Godofredus Klaunigius (*l*), in particular found "a cancerous ulcer" of the same kind, "in the collum

(*f*) De Mulier. Organ. c. 9.

(*g*) N. 33.

(*b*) Epist. 52. n. 2. & 6.

(*i*) Eph. n. c. dec. 3. a. 5. & 6. obs. 126.

(*k*) Earund. cent. 8. obs. 27.

(*l*) Earund. cent. 3. obs. 65.

“uteri; so that this very collum shew’d nothing of its own substance remaining, but the external coat or membrane: the other parts being intirely consum’d.”

This so very considerable consumption of the substance of the uterus, with-in only a short time, has often induc’d me to wish, that, in the observation which I took notice of in the foregoing letter (*m*), wherein “the uterus” was very small like a pigeon’s egg, and in a manner corrugated;” in a woman of about eight and thirty years of age; to wish, I say, that the same had been dissected.

For as the patient “had labour’d, through the whole of her life, under a “fluor albus;” it is, perhaps, not very contrary to probability, to suppose that the substance of the uterus had been consum’d gradually, though not from an ulcer of that kind; but that the substance had been so injur’d nevertheless, and so wasted away, that not so much the uterus itself, as the external membrane of it, being corrugated, and subsiding, it was at length reduc’d to that state of smallness.

27. After having refer’d you to these observations, I must now do what I promis’d you: that is, I must go on to consider the small beginnings of the causes of great disorders of this kind; and consequently of the causes of the fluor; I mean excrescences of the uterus, or tumours, that I have observ’d by means of dissection: not all of them however, but those which I suppose to relate most to the present subject. For they are either external or internal.

Observations of the first kind, which do not so much relate to the subject in question, I have taken notice of, briefly, in the thirty-ninth letter (*n*). But I shall here make mention of the internal ones, which are describ’d elsewhere; and shall add some, for which I should not easily find another place.

Those tumours however, which grow within the very substance of the parietes uteri itself; one of which I have describ’d in the forty-fourth letter (*o*); will be here omitted for this reason; that they do not always reach to the cavity of the uterus, though they are greatly increas’d: as appears from that very large tumour, whereof you will read in the preceding twenty-third section of the Sepulchretum (*p*).

To the internal then belong; besides those minute tubercles which I describ’d above (*q*), and those small verrucæ which I took notice of on that occasion (*r*); certain small excrescences, of different forms, observ’d in several uteri (*s*), one in each; and others also, very low and smooth; but more in number, and of a considerable circumference (*t*); and in like manner out of three, two at least, which were affix’d to the uterus, by a peduncle of no slender size; and were less hard in their substance than the uterus itself; the substance, both internally and externally, being so full of blood as to be quite black (*u*): finally, a scirrhus tubercle in the corona of the os uteri (*x*).

But these I have written of to you already. Now let us add the others.

(*m*) N. 21.

(*n*) N. 36.

(*o*) N. 23.

(*p*) Obs. 11. §. 2.

(*q*) N. 14.

(*r*) N. 15.

(*s*) Epist. 12. n. 2. & ep. 23. n. 11; & ep. 45. n. 16.

(*t*) Epist. ead. n. 17.

(*u*) Ibid. n. 24.

(*x*) Ibid. n. 23.

Yet if you desire to know of other appearances, of the same kind, seen by other persons, you will find, among the rest observ'd by Gvolfg. Hannib. Langius (y); after the uterus had been greatly injur'd by a midwife; a certain scirrhus tubercle, stopping up the orifice thereof to such a degree, that there was no passage for the discharge of flatus; nor any admission for the probe: and you will also find, that, by the younger du Verney (z), a glandular body of the bigness of a nutmeg was found within the uterus of a dropical virgin.

Others I purposely pass over: and immediately go on to my observations that still remain.

28. A woman of a middle age, had died in the hospital of St. Mary de Morte at Bologna, of a disorder of the thorax, in the latter end of April of the year 1706. As I examin'd the viscera of the belly in this woman, I observ'd the following preternatural appearances in the genitals.

The lower part of the vagina, where it lay nearest to the orifice of the urethra, retain'd some traces of an ulcer: and these were still more manifest in one of the labia pudendi. These appearances gave me a suspicion of a lues venerea having preceded, as an excrescence at the anus also did; which consisted of a kind of white substance.

Turning my eyes from thence to the ovaria, and tubes, I saw the former to be of a whitish colour, and corrugated; the surface being hollow'd out, in some places, with furrows drawn in a serpentine form.

When I cut into them, I found them to be somewhat hard: and in one of them was an empty cell, which was comprehended in two coats; the one internal and black, the other external and cineritious: in the other, besides smaller vesicles full of moisture, were two pretty large cells, in an empty state, one of which had a coat that was become in part bony; but the other had a coat that was become perfectly bony, and so furrow'd as to resemble some of the folds of the small intestines as it were.

To one of the tubes, a corpuscle, in its shape and consistence similar to the chrySTALLINE humour of a small fish, when boil'd, adher'd externally; and to the other, a congeries of the same kind of bodies, though far more small, adher'd. The uterus was large, and had thick parietes; but in particular the fundus.

The cavity of this viscus was much more large transversely, about the middle of its length, than it generally is; and in that part, or rather a little more posteriorly, the anterior surface of the uterus on one side, and the posterior surface, were connected together by the interposition of a thin membrane; but from the opposite side an excrescence began, which being fix'd to that one place, and unconnected in other parts extended itself in the form of a circle, the diameter of which was somewhat larger than the breadth of a man's thumb.

The thickness of this excrescence was inconsiderable; the surface being distinguish'd here and there with red spots: and as to the substance, it was almost the same as that of the uterus itself, except that something of a mucous substance seem'd to be intermix'd with it; which made it more easily admit of distraction.

(y) Comm. Litter. a. 1735. hebd. 29.

(z) Mem. de l'Acad. R. des Sc. a. 1703.

The cavity of the cervix, both at its beginning, and termination, was much more streight than it us'd to be. But from the beginning of this cavity, and on the opposite side to the excrescence I have describ'd, hung another very small excrescence; of the same substance as the other; but in the whole of its surface of a red saturated colour, and of the figure of a pear hanging by its stalk; except that, on its anterior and posterior surface, it was flat.

29. This second excrescence, by reason of its form, brought into my mind those uterine polypi, which Ruysch (*a*) delineated; as growing out from the lower part of the cervix, and pendulous therefrom; after that observation, which you will be surpriz'd to find not transfer'd into the Sepulchretum; when you call to mind the great quantity of acrid fluor that was join'd with these appearances.

And as excrescences of this kind, just like polypi of the nostrils, may become cancerous and malignant, and have a malignant ulcer join'd with them; that observation sufficiently teaches and demonstrates, that it is not without justice we here consider excrescences of the uterus, as being capable of giving origin to those very bad disorders.

And with that view I shall add four other examples to this; all seen by me when I was giving public lectures in anatomy: the first of which will belong to the same class with this lower, and small one, and the others to that upper and larger excrescence.

30. In the year 1728, I dissected a woman, in whom was a peculiar venous trunk; but not very small; parallel to the trunk of the vena cava on the left side; communicating on one hand with that trunk, where it receives the iliac vein, and on the other with the emulgent vein; which vessel I shall perhaps describe at another time and in a more convenient place; as I shall also speak of the parts that lie nearest to those veins, among which was the trunk of the great artery, that shew'd slight beginnings of bony scales, on its internal surface; for I mean now to speak of the genitals only, in which I found the following appearances.

The ovaries, or, if you please, the testes, were small: one of them was very much contracted, and the other indeed contain'd no vesicles, and but a very few cells; the lesser of which, except that they had nothing in them worthy of remark, were similar to that larger one, which seem'd to comprehend, within a thick coat, of a yellowish colour inclining to white, a sinus in the form of a pretty long duct, which sent out very small ramifications transversely: although I was afraid, lest the coat, which formerly, perhaps, had contain'd a spherical cavity, being afterwards collaps'd, and contracted into itself, might, by the interception of its own rugæ, have given the appearance of that duct, and of these ramifications.

Looking at the alæ vespertilionum, in order to demonstrate the nervous plexusses therein, in one of them I met with the slightest and most small beginning of the plexus as it were; but in the other there was not even this.

At the osculum uteri was a kind of prominence of a green colour. A little above, from the paries of the lowest part of the cervix, hung, by a short and

whitish stalk, a small excrescence smooth in its surface, and of a red colour inclining to brown; less oblong indeed in its figure, but, in other respects, very similar to that smaller excrescence, which was last describ'd in the woman above.

31. A woman, of fifty years of age, or upwards, having receiv'd a wound upon her head, died on the thirtieth day after that; which was in the beginning of February in the year 1738. I could scarcely examine any other part but the genitals. In which I observ'd the following things.

The testes were considerably hard, dry, and without vesicles. Although they were not at all different from each other, in any respect, yet the nervous plexus was much less in the right ala vespertilionis, than in the other. The fundus uteri, when open'd, show'd upon its lower, and posterior surface, a small excrescence, nearly of the form of a circle, depress'd, and, in its superior part only, disjoin'd from the internal membrane of the uterus. And of this very membrane it seem'd to be an excrescence, rather than of the substance of the uterus.

For cutting through this excrescence, the subjected paries of the uterus, and that membrane; and comparing one with another; I found the excrescence to be made up of the same more compact substance that the membrane was: besides, I found it of the same smoothness externally, and of the same colour as that membrane; if you except only the upper edge, by which I have said it was disjoin'd, for this alone was red.

32. As I was looking upon, and considering, these appearances, a suspicion came into my mind, that this excrescence, and others of the same kind, were, perhaps, nothing else but the internal membrane of the uterus, rising up in a certain place, from a nine months adhesion of the placenta; and particularly in those, from whose uterus it had been pull'd away with any kind of violence.

For in this manner it may be conceiv'd, why these excrescences are of a circular form; and why not equally manifest in all women that have born children.

And I remember'd to have read in Ruysch (*b*), that altho' the protuberances, "which are found in cows that are pregnant;" and which are "nothing but a uterine efflorescence, that, in the time of gravitation, is rais'd up into a tumour, in that place where the fœtus is connected to its placentulæ;" are not seen in women, "while they are in a state of pregnancy; yet in that place, where the placenta applies itself to the uterus, that the internal coat of the uterus sometimes, also, raises itself up into a tumour, in some measure."

But, on the other hand, I observ'd that Ruysch does not seem to have attended to this circumstance, that in cows these protuberances exist from the very birth, and are only enlarg'd in pregnancy like the other parts of the uterus; nor do they vanish away afterwards, when the empty uterus constricts itself: whereas this slight tumour of the internal uterus in women (in regard to which, we shall consider, on another occasion, of what nature it is, and whether it be from that coat of the uterus) does not appear to us, before the placenta has applied itself to the uterus in a very close manner; nor after

(*b*) Theat. Anat. 5. in fin. Arcula 3. n. 1.

the uterus has properly contracted itself on exclusion of the foetus; nor indeed does Ruysch say that it then appears to him.

But I remember'd in particular, that excrescences of the same form had also been found by me in virgin uteri; or at least in the uteri of those who had never born children: as in this history which I shall immediately subjoin.

33. An old woman; who had been taken into the hospital, on account of an ulcer of the leg; staying there very contentedly, had the same thing happen to her, which frequently happens to others likewise: that is, she was, in consequence of the impure halitus, seiz'd with a fever; which was at first, as seem'd by the previous cold, of an intermitting kind: but soon after, when it could not be restrain'd by the Peruvian bark, it became continual and acute, and was attended with some delirium. The woman was therefore carried off by it.

And, in examining almost all the viscera of this body, about the middle of February in the year 1736, I remark'd these few things which seem'd to be morbid.

The pia mater of the brain had its vessels distended with blood, and could be very easily drawn out of the deep furrows, which are upon the surface of that viscus.

The great artery, after going out of the heart, both above the valves, and in other places; as, for instance, where it ran down through the belly; show'd, internally, the white beginnings of future small bones.

That the uterus had never been pregnant, appear'd from the inspection of the hymen; which though it was low, was entire; or, at least, had never been lacerated. And the same thing was confirm'd by the internal structure of the uterus, when laid open; being, in a great part of it, just as it is in those who have not born children.

Yet the internal and posterior surface of the fundus, which was transversely dilated, was cover'd over, at its upper part, with an excrescence of a circular figure: which, beginning from the right side itself, terminated at no great distance from the left; so that the diameter of it was not much less than that in the woman of Bologna, who was describ'd above (c).

But it was not, like that, free and unconnected, if you except a small part which belong'd to the left and lower border: the remainder of it adher'd to that surface of the uterus which was just now spoken of. The thickness of this excrescence was inconsiderable; the surface of it was smooth, and its colour externally bloody: internally it consisted of a whitish, compact, and firm substance.

34. I examin'd the urinary parts, and the parts of generation, of a cachectic, and almost dropical, woman, about the end of January in the year 1749; when I found the following appearances in particular.

The left kidney had its surface unequal, here and there, with many cells which were full of serum; or rather with middle-siz'd, or very small, hydatids.

For although they were, in great part, buried within that viscus, so that none of them reach'd to the pelvis; yet they were also prominent outwards:

so that some of them, which had burst asunder, might, by pouring out their serum, into the cavity of the belly, add some new materials to the incipient ascites.

The other kidney had none that was conspicuous on its surface; for one; which was of a middle size, and within the substance; was contain'd betwixt the surface and the pelvis, without reaching to either. The urinary bladder; at least at its lower part; was universally red, and inflam'd, from a great number of small vessels being crowded together.

But as to the genitals, a tumour of a spherical figure had form'd itself upon the uterus; the diameter of which tumour was equal to an inch and half. The greater part of the tumour was prominent on the outside of the uterus: the lesser part was so buried in the anterior paries thereof, on one side, as not to reach to the cavity of that viscus.

It was universally hard, and internally white; the whiteness, however, being variegated in several places with spots, that were less white. The internal surface of the cervix was white, and unequally tuberos; if I may be allow'd to speak thus; but that of the fundus was red, and rising up into two slight prominences, neither of which was red, except on the surface.

35. To these four observations; which, as I said, were made in the college; I choose to add another which I made in the hospital, about the middle of December in the year 1748.

36. A middle-ag'd woman had died there, who was said to have labour'd under a melancholic delirium, and a slight fever, at her own house, for a long time: nor yet could we know this for certain; nor from what cause she was, at length, at the point of death, when she was brought into the hospital. It will be your business then to conjecture, from the preternatural appearances which I observ'd, in examining almost all the viscera, by what disorders she was carried off.

The body had a pretty good appearance. The cerebrum; to begin with that; had no peculiar nature; but I found the cerebellum to be lax. Within the cranium I no where found any water.

Nor did I observe any thing very considerable in the thorax. Even the lungs were not, in any part, connected to the pleura, by the slightest attachment. In the heart was scarcely any coagulated blood; and in the great vessels none at all: but I saw a small quantity of blood come forth from the aorta, where it begins to descend.

In the belly, however, were many things that I observ'd. And first, when the abdomen was laid open, blood was found in the hypogastrium, betwixt the muscles; being coagulated and grumous, as if it had been the consequence of a contusion: the cause of this appearance was unknown; nor did any recent injury, in the cavity of the belly, correspond to that place.

The spleen was of such a length, that beginning from its usual situation, it reach'd quite to the os ilium; with which very great length the other dimensions did not agree. It was lax, and not livid, but red in great part; at least on its anterior surface.

The gall-bladder was distended with a great quantity of bile. There was some water in the lower part of the pelvis. The bladder internally, at the

orifice of the urethra, and a little above this space, was distinguish'd with sanguiferous vessels.

The uterus was a little inclin'd to the left side; and yet the orifice of its osculum, upon laying open the vagina; which was almost universally livid, and smelt very strong; was more on the right side, than this inclination seem'd to account for. And the cause of this was, that the corona of the osculum, which was harder than is natural, was increas'd on the left side by a kind of tumour.

37. But of excrescences, and internal tumours, of the uterus, enough at present; lest these letters should be increas'd to an immoderate size, as I have said is to be fear'd.

You easily perceive, however, that it is not surprizing, if from disorders of this kind, which are so frequently found, the worst of tumours, by the addition of some other accidental cause, are sometimes form'd; and from these, when ulcerated, if incurable fluors are brought on. In the next letter I shall treat of the remainder of womens disorders. Farewell.

LETTER the FORTY-EIGHTH

Treats of false Pregnancy, Abortion, and unhappy Delivery.

IF you should happen to be surpriz'd, that I give no more than this one letter to so many arguments of that kind; you will be still more surpriz'd, when you find that no more than two, and these not very long sections, that is the thirty-seventh, and thirty-eighth, are allow'd in the Sepulchretum; not to these subjects only, but to many others at the same time; among which are the origin of twins, hermaphrodites, and the marks of virginity.

These subjects I think are not proper to be treated of here; where the intention of prosecuting the plan of the Sepulchretum requires it; lest I should treat of other things besides the hidden causes of diseases, investigated by anatomy: and if I were to treat of them, the greater part of those things which are said, in the Sepulchretum, thereon, would have very little, or no weight with me.

But lest you should suppose me to say this without good reason, I will give you some instances of what I assert.

For what has that observation of Gerard Blasius (*a*) to do with the origin of twins; I mean that in which he makes no hesitation to consider the vesicles of the testes, not to say, probably a kind of hydatid that adher'd on the outside of one of them, as eggs?

Or what has the subjoin'd appendix to do with this same origin? For in this; to omit other things that do not differ from the opinion of Blasius; "the aura feminalis is carried through the vas deferens, or ductus brevis," that is the round ligament of the testes, as I suppose, quite to the testis itself; as if the females of quadrupeds were not without this ligament: "the oviducts of hens" are said to be "strait and pretty lax; but in man narrow, and very tortuous;" as if, although they are considerably lax in hens, they were not, at the same time, so much the more tortuous, in proportion as they are longer than the tubes in women; that is in a proportion which admits of no comparison.

And these things are added; the connexion of the tubes with the testes ought to be more nicely inquir'd into, lest those appearances which we call jagged edges, fimbriæ, or morsus diaboli, may be the effects of rupture; that is to say, lest the tubes, having, perhaps, previously adher'd to the testes, in a natural state, "should have been torn away therefrom, by carelessness, during the extraction of the testes;" as if the tubes consisted of a membrane extremely thin, and their fimbriæ were of such a structure, and figure, as to be capable of being produc'd in that manner: there is betwixt the cervix uteri, and the testis, another duct that carries the semen, "which might not improperly be call'd cervicalis;" as if it were not certain that a duct of this kind was nothing more than some sanguiferous vessel: finally, not to take up too much time; through the round ligaments of the uterus, "the feminal matter, and other excrementitious matters also, that are collected in the uterus, are expell'd to the groins;" as if it were not manifest, that these ligaments do not communicate with the cavity of the uterus. And thus far upon the origin and generation of twins.

And pray what relation to hermaphrodites have those three dissections (*b*)? since with a female pudendum, was join'd a penis which was neither furnish'd with any urethral orifice, nor emitted urine; so that, even without any dissection, it was certain that this penis was nothing more than a clitoris of a monstrous magnitude.

Finally, in respect to the marks of virginity, it would have been better to say nothing at all than to propose those two, or three, observations (*c*), in the latter part of the thirty-eighth section; from which the reader in part scarcely knows, what is not to be reckon'd among those marks, and partly believes, that even the hymen itself (which however is the principal of all the marks of virginity) is not to be number'd in that class; especially as in the adjoin'd Scholium it is said that the caruncles alone may be consider'd as that principal mark, and the reader is refer'd no less to Pinæus the assertor of this opinion, than to others.

But what is my opinion on these points, I think I have the less occasion to

(*a*) 4. in sect. 37.

(*b*) Ibid. obs. 6.

(*c*) Obs. 7 & 8.

take any notice here, because I have sufficiently said, heretofore, in the *Adversaria* (*d*), what I had observ'd; and what is my judgment on the subject of virginity appears in that response entitled *supra Judicio Obstetricum de Mulieris Virginitate*.

2. And even in the thirty-eighth section, there are not a few things which either ought not to have been introduc'd in that place, or, if added, ought to have been entirely amended by some animadversion.

Nor indeed can we make the same apology for these things, that may perhaps be made for the greater part of those we have made remarks upon above; I mean that at the time they were publish'd, no better things had been as yet advanc'd: although even then much better things had been publish'd; and still more so, at the time in which the *Sepulchretum* was reprinted, and increas'd.

For without doubt, there was no need of recent observations, that these things, some of which I shall point out immediately, might not be produc'd without emendation.

In the first observation, for instance; to omit that some things, in the dissection of a certain foetus (*e*), are so propos'd, that, although they are natural appearances, they may be suppos'd, by the greatest part of readers, to have been the effect of a vitiated structure; who can bear (*f*) that the funiculus umbilicalis of foetusses, "is wont to be generally, and in all, of the length " of some ells?" Or who can think it "wonderful (*g*)," that a woman, who had miscarried seven times, should have produc'd "all her abortive foetusses " just of the same magnitude; that is nearly equal to a joint of a thumb; " though sometimes at a longer, and sometimes at a shorter, distance from " the time of conception;" who, I say, can suppose this to be "wonderful," unless any one who does not understand that the abortions were discharg'd at different times indeed, but all died at the same time?

For that a dead foetus may be retain'd even many months in the uterus, and without any corruption, or bad smell, is sufficiently shown; besides other observations, and particularly those that are to be met with in *Ruyfch* (*b*); by that which immediately follows (*i*).

And in the second observation (*k*), when a certain foetus, whose egress had been prevented by a tumour of the passages, was found to have his cranium compress'd on one side; this inference is drawn from it: "from which it " clearly appears, not only that the expulsive force of the uterus has an effect " towards the protrusion of the foetus, but also that the infant endeavours " to free itself from the confinement of its prison:" is this deduction of a matter, which, of itself, is in other respects not false, clearly prov'd to you: since the mother is said, "to have had labour pains for five or six days," and the infant to have given no signs of life after the first days of those pains; so that it is by no means certain whether that compression of the cranium is to be ascrib'd to the efforts of both mother and infant, or to the efforts of the mother alone.

(*d*) I. n. 39. & IV. animad. 23 & 24.

(*e*) §. 3.

(*f*) §. 7.

(*g*) §. 6.

(*b*) *Thef. Max.* n. 40. 158. 210.

(*i*) 7.

(*k*) 3.

But let what I have said be sufficient. For you yourself, in reading over the fourteen examples; which are produc'd in the first observation, in such a manner, as if all of them related to abortion; will be at no loss to determine whether the second, which relates to mature delivery, ought to have had a place among the rest; and still less, whether all the observations that are collected under number nine relate to the present purpose; as the greater part of them, at least, have no reference to the preternatural, but to the natural, state of the uterus, both in gravid women, and those who have lately born children.

But this is a subject on which you must expect nothing from me here. For those things which I also have observ'd, in respect to that state, more than once, and with some accuracy, belong to a work quite different from this.

However, though I have, with ingenuousness, and in order to be of use to your studies, made these strictures on the sections of the Sepulchretum I have specified; I nevertheless very readily confess, that there are many things in these sections, which deserve approbation.

And the heads of these I shall follow in this letter; at the same time however, interposing, or adding others, which I shall suppose to be necessary, and to relate to the present subjects.

3. And first in regard to false pregnancy; it is too well known that physicians are not uncommonly deceiv'd, either in taking the true for the false, or the false for the true. But I could wish that certain signs always existed; for in reliance upon these, learned and attentive physicians, at least, would not be in danger of falling into either of the errors.

The sign of true pregnancy, that is the motion of the foetus in utero, is certain, and obvious, to the hands, and sometimes even to the eyes: and any one who has once properly perceiv'd this, by the application of his hand to the abdomen, especially when cold; for by this means the motion is generally excited; will never suffer himself to be impos'd upon by flatus of the intestines, nor any other motion whatever; so peculiar is that motion, and of such a nature, that it cannot be produc'd except by the body of a living foetus.

Yet, in the first months we not only want this sign; but the others also sometimes; and now and then even in the last months, by reason of the weakness of the foetus; or from other causes.

I remember that I was formerly ask'd to go and see a young woman, who, from the time that a surgeon had taken away a cancerous tumour, as they said, from her breast, had her belly begin to swell; which was now nine months. The less reason I found, upon examining her, to fear, from any of her symptoms, that a cancerous tumour was reviv'd in the uterus; as was then suppos'd; with so much the more time and care did I examine, with my hand, the tumid uterus.

As the uterus seem'd to be impregnated, but I felt no motion there; and as the presence of her relations did not suffer me to ask for cold water, to dip my hot hand in; for the weather was extremely hot; I call'd aside the physician of this young woman, and although he asserted that he had never felt any motion in the belly, I advis'd him nevertheless, that notwithstanding every

every one suppos'd the patient to be an untouch'd virgin, he should act with caution, and circumspection; and not to forget what had happen'd in others like her, a few years before, to the great reproach of the physicians who attended.

Do you desire to know the event? This untouch'd virgin soon after brought forth a child. The sign that I have spoken of therefore is a certain sign when it is present; and yet the woman may be impregnated when it is not observ'd.

Another sign I have read of as propos'd by men in other respects learned, and experienc'd, for a certain one; and one that occurs in all gravid women; I mean the navel protuberating, on the contrary to what happens in a dropsy, and all other tumours of the belly.

But does it never protuberate in an ascites, though some perforate it, when protuberant, in order to draw off the waters? And in like manner is not the cause that they assign, of the navel being prominent in pregnancy, common to other tumours whereby the intestines are forc'd upwards?

But it is needless to make these and other inquiries, as they themselves confess, that this sign does not exist before the end of the third month; and as it sometimes moreover happens, that utero-gestation is join'd with a dropsy.

Not to take notice here of the matron mention'd by Platerus (*l*), who was wont, "as often as she was pregnant, to fall into a dropsy;" there are few physicians who have not seen both of them join'd together sometimes; or who, at least if they are prudent and cautious, not being ignorant of the errors of others, have doubted whether they might be join'd together.

For which reason I was the more surpriz'd some years ago, that a physician, in other respects learned, and a man of great experience, being in consultation with me for an illustrious matron; who had come hither when labouring under an ascites and anasarca; should have spoken so as to be solicitous about nothing else, but about immediately prescribing the most effectual remedies against both these dropsies.

I, however, seeing that the matron had young children, and was herself still in the prime of life; and not being able to inform myself, for a certainty, whether she was then pregnant or not; these medicines, said I, I universally approve, provided, however, that they are not begun to be made use of, before it is quite clear as to this circumstance whereof I am inquiring; and in the mean while let some more gentle remedies, and such as are safe on both sides, be made use of; and in particular a proper method of living.

The woman was wise, and listen'd to me; and after having return'd home, sent, at a proper time, to return me thanks, and to inform me, that, having brought forth a son, she was at the same time freed from both those diseases; and that nothing thereof remain'd but a tumour of the legs.

There are, I see, many likewise who depend upon a very ancient sign; I mean one that is propos'd in the aphorisms of Hippocrates (*m*); "those who are pregnant have the os uteri compress'd:" a mark certainly that is not to be

(*l*) Obf. 1. 3. ubi de Extuberantia.

(*m*) Sect. 5. Aph. 52. despis'd.

despis'd, and is very useful in those first months, in which there is no room, as I have said above, for the former.

Wherefore I have made use of this sign with success, when it was in my power; but I had it in my power very seldom; the women of our country being, for the most part, repugnant to an examination of that kind. Yet I have not made use of it without caution, not being ignorant that there are disorders of the uterus, wherein, as Hippocrates in part teaches (*n*), the os uteri is clos'd.

And for the same reason I did not believe it to be sufficient, if a skilful examiner perceiv'd, that, to some constriction of this orifice, some increase of the corona was likewise added; or if, having forc'd this corona upwards with his finger, and soon after drawn it away gradually, while the woman was in a standing posture, he observ'd, on suffering the corona to slip down again, the uterus to be pretty heavy; or, finally, if he perceiv'd the same orifice to be inclin'd towards the posterior parts.

For although these things, with the addition of the sign of Hippocrates, certainly increase the force of that; yet I judg'd that there was no great dependence to be plac'd upon them; unless when that corona, as Galen (*o*) formerly admonish'd, was not harder than is natural, and all symptoms of diseases, and affections of the uterus; in some of which, at least, there is an inclination forwards, whereby the osculum is turn'd backwards; were wanting.

4. That we may not, therefore, take a true pregnancy, for a false one, we must have a peculiar regard to the signs that are not present, as well as to those that are; and above all, if the woman has been pregnant before, we must consider whether the signs, from which she judges herself to be pregnant now, are the same that had preceded in the beginning, at other times.

For by reason of this circumstance being despis'd; which is sometimes fallacious indeed, but not to be neglected for that reason; I have seen physicians fall into an error, as you will clearly conceive, from three observations at least, which I choose to subjoin. All these observations relate to women of rank; the first to one of this city, and the others to women of my native city.

5. A foetus had been conceiv'd six months and some days; for from that time the woman had not convers'd any more with her husband; the mother not doubting, by reason of the uneasy symptoms which she had usually suffer'd, after other conceptions, but that she was really with child.

And now the uterus had begun to swell in the third month, when, a great quantity of blood being discharg'd from the hæmorrhoids, the swelling was considerably abated; so that it was in general suppos'd the woman had been deceiv'd.

Wherefore, although she afterwards found her belly swell again, as soon as she had gather'd her strength after the ceasing of this flux; she was not for that reason suppos'd to be pregnant. At length the same flux return'd, and a fever came on besides.

(*n*) Ibid. Aph. 55.

(*o*) De Loc. Affect. l. 6. c. 5.

And then neither she herself, nor her physicians, suspecting any thing of pregnancy; blood was taken away from her arm, and afterwards even from her foot: after which a medicine was, also, given to open her bowels.

A few hours after this had been given, behold! contrary to the expectation of every one, a dead foetus was discharg'd; and seven hours after that the secundines. And these, together with the foetus, were brought to me on the following day in the morning; which was the twenty-ninth day of August, in the year 1727; when I also had the case related to me.

The foetus, from the crown of the head to the soles of the feet, was of a length equal to the breadth of six fingers: the funiculus umbilicalis was nine; but of a surprizing slenderness, so as to resemble a thread of a moderate thickness; being without any intorsion, and every where equal.

The body of the foetus, which was of the male sex, was well-form'd both internally and externally; except that the whole head was of such a figure, that it seem'd to have been compress'd on the sides.

It had been of a white colour at the time of its discharge, but was now become brown. Almost all the viscera were pallid, and nearly destitute of colour; and in particular the liver, which was of a slight yellow, degenerating into a great paleness. The urinary bladder was empty; and not only this but the intestine colon and the rectum.

Although nothing of blood, and indeed nothing of a bloody colour, appear'd in any part of the foetus, wherever you cut into it, or of its funiculus; which was brought to me in an entire state, being connected on one side to the navel, and on the other to the placenta; and although the first branches, at least, from this rope into the placenta, were slender; certain large globes as it were extending themselves somewhat in length, of a blackish colour, and distended with almost fluid blood, were, nevertheless, seen through the membranous surface of the secundines, where it lay under the placenta; which in this subject was really very large in proportion to the smallness of the foetus.

However, although the body of the foetus was neither externally flaccid, nor cover'd with rugous integuments; nor any disagreeable smell proceeded therefrom, or from its secundines; I nevertheless did not doubt but it had either lain a considerable time dead in the uterus, before the dilatation of its orifice; or, at least, that it had lain in a very weak state, and like a dead foetus, before it was quite dead.

6. The sudden efflux of a great quantity of blood had, as appear'd from the dissection, render'd the foetus, and its funiculus, bloodless; and the latter likewise so exceedingly slender. However, as there was suppos'd to be no foetus at all in this case, the error of the physicians becomes somewhat more excusable, than in the next history.

7. A foetus that was, in like manner, immature, and dead, had been ejected by another matron, in the month of August, in the year 1716. This woman supposing herself pregnant from her usual symptoms, the physician, in order to diminish the blood, which, as he thought, abounded, took away the weight of a pound from her arm.

As her belly was not afterwards enlarg'd, in proportion to the time of her pregnancy; and the woman did not perceive the motion of the child, at the

time that she had been used to perceive it; both the midwife, and the physician himself, otherwise a learned man, but not easily giving up an opinion which he had once imbib'd, pronounc'd that it was not a foetus which she bore in her uterus, but a mola, or false conception.

The mind of the woman being alarm'd at this pronounciation, and afflicted with very great sadness, it happen'd accidentally, that I withdrew, during the summer, into my native place: and being ignorant of these things, I was brought to her by some noblemen who were her relations, and very intimate friends of mine: and this at her request.

When I saw her to have a good colour, as she usually had, and, except the sadness of her countenance, to be in good health; what need, said I to her, have you of a physician? Why, said she, that he may inform me whether I am with child or not.

Then asking the proper questions of her, and examining her belly with my hand, and hearing and feeling nothing, from whence I might not suppose her to be with child; and learning from her, and even from her waiting-maid, who had always attended her chamber, that every thing was now, and had been, the same as in her former pregnancies, if you except those two things that I mention'd just now; you are with child, said I; nor do I think those two circumstances would have been wanting, if you had not done what you did not in former pregnancies, when you was much younger; I mean if by letting blood in such a quantity, you had not diminish'd the strength of the foetus, and retarded its increase.

After this at length I heard who had order'd this bleeding, and the opinion that had been pronounc'd in regard to the false conception. Then said I, what reasons this gentleman may have for his opinion I do not know: but I have not one that inclines me to suspect a mola, or false-conception; yet I affirm that you are pregnant with a foetus, which is in a weak and languid state, and which, unless you recruit yourself, and it, by a proper method of living, and by cheerfulness of mind, you are in great danger of not carrying till the proper time of your delivery.

These things were true, but inculcated when it was too late. For I having gone into the country for some time; it happen'd not many days after, that the woman, without expecting it, had somewhat of a bloody discharge from her genitals. And the physician, in consequence of his prejudice in favour of his own opinion, order'd her to ride in a coach pretty swiftly, and over rugged and uneven places.

From thence arose pains. The patient return'd home. Somebody was immediately dispatch'd to the physician, to consult him what should be done. The physician prescribes a clyster, and says that he will come by the time this has had its effect. While the clyster was discharg'd, a dead foetus is discharg'd at the same time, together with the secundines; but without any false conception.

Not long after comes the physician. The maid, of whom I spoke before, runs to meet, and accosts, him, almost in the same words which were us'd on an almost similar occasion, formerly, to her physicians, as you have it in the Sepulchretum (p), by that noble Venetian matron Helena de Mocenicis.

For the maid showing him the *foetus*, said, Look here, this is the false conception that my mistress bore.

The *foetus* it was out of my power to dissect; being absent, as I have already said. But I heard, from those who saw it, that it was slender, and had no ill smell.

8. Yet physicians deserve to be forgiven, if they do not join obstinacy with a false opinion. I found one to be much more docile in the same city, as you will immediately perceive, from the history of the case which happen'd in the year 1721.

9. Now take a third history of a *foetus*, that was discharg'd by the mother in an immature and lifeless state; which history deserves to be written with so much the more accuracy, because a *mola* was discharg'd at the same time, and those things had preceded, which; as in a certain observation of Schacherus (*q*), that in some measure agrees with this; almost remov'd the opinion of true pregnancy.

A matron of a slender habit, and small stature; but than whom I never remember any one to have generated more blood; and the happy mother of many children, yet sometimes also subject to abortions; having, after her last delivery, which was follow'd by a very great discharge of the *lochia*, pass'd the winter in a dejected and gloomy state; in the month of April suppos'd, from the tokens which she had been accusom'd to perceive, join'd with a retention of the *menfes*, that she had conceiv'd again.

These symptoms were follow'd by so great a loss of appetite, that she only ate in the evening in general, and that with difficulty; and whatever she took in the morning was thrown up by vomiting.

To this was added, about the thirteenth of June, a flux of blood from the uterus; against which disorders; not altogether new or unusual to the patient; notwithstanding the use of the waters of Nocera had been of advantage, at other times, after trying many things in vain, it was of no advantage now.

For these reasons then, I was call'd to the patient about the middle of July. As she had the most unspeakable aversion to blood-letting, I therefore recommended such things as she would not obstinately refuse; as for instance the use of jellies of calves feet, coral reduc'd into a fine powder, cydonites, and a few other things of the like kind, which might counteract both the disorders; yet in such a manner as not to restrain the flux of blood with violence.

In the mean while, both the disorders continued; yet so as to be born without difficulty. For every day in the morning she rose from bed, sat, walk'd, and even, when she pleas'd, was carried through the city in a coach (though this was what I did not much approve) and scarcely any blood was discharg'd.

In the night only, when she lay either supine, or on her left side; for on her right side she could not lie; was it discharg'd; whether the heat of the bed excited the discharge, or whether, when she was not in a recumbent posture, any thing oppos'd itself to the *osculum uteri* which cover'd it, or in a manner stop'd it up.

Besides that which had been discharg'd in the night, there was a large

quantity of coagulated blood, which came away when she first rose. In the mean while, to her other causes of grief was added one very violent, join'd with sudden terror, on account of an unexpected misfortune of her husband; which, as the whole city heard it with commiseration, so his wife heard with tears and wringing of hands.

On the first night, indeed, after this calamity, the flux of blood was almost intirely stop'd. But during the following nights, it flow'd more plentifully than before. There was now no person who, considering so great, and so frequent, an effusion of blood, could believe it possible for the woman to be with child; and even she herself believ'd it no more.

The physician however, although my senior, listen'd to me, who frequently urg'd that we must for a while withhold our opinion, in the case of a woman who abounded, to such a degree, with blood: that all the usual signs of pregnancy had preceded; that no traces of abortion had ever yet appear'd in the effus'd blood, though it had been always accurately inspected: that the uterus swell'd slowly indeed; but if the blood should at length flow more sparingly, it then would probably be elevated in a very little time.

We must endeavour therefore to render the discharge more moderate; for that by this means the strength of the patient might also be more easily preserv'd, the decrease of which was already to be argued from the patients legs not being so strong as they had hitherto been, and from the rosy colour of her countenance being diminish'd.

As other things, which he had administ'rd with this intention, did not answer very well; he began to give the old conserve of roses, as it is call'd, vitriolated, with which and the confectio alkermes; for so it is call'd; without perfumes, he involv'd citron-seeds bruis'd, and reduc'd them into the form of a bolus.

With this bolus not only her appetite began to be something better, but a much less quantity of blood was discharg'd. And then; for a third part of the month of August was now pass'd; not only the breasts began to swell, as in former pregnancies, but even to be rais'd up very high.

Here then, the patient herself, and others, began to return to the opinion of pregnancy, which they had given up. Yet there was something unusual that made the patient and me both uneasy; that is a frequent sense of pricking in the uterus. And on this account I was inclin'd to examine her belly accurately with my hand.

In doing of which I became still more uneasy, as I perceiv'd the uterus not to be acuminate towards the navel, but more extended in a transverse direction on both sides, and not bearing the touch without pain, if it were press'd upon pretty strongly; especially at the right iliac region. I not only dissembled my suspicion with the patient by words, but even by my countenance, as I thought it my duty to do.

I open'd it however to the physician, and to her husband, by saying that I fear'd lest there should be a false conception besides the foetus; and yet that there need be no alteration for this reason, in the method of treatment: for that where there was a suspicion of a false conception, and the increase of the uterus was larger every day, in proportion as the less blood was discharg'd, there was not any room for such things as astring'd violently; especially as the

the blood, in some nights, did not flow very sparingly, yet for the most part of them with sufficient moderation at present: nor, on the other hand, where the very great discharge might easily return, and there was suppos'd to be a foetus together with the false conception, must we have recourse to forcing, and stimulating, medicines, which are not always safe, even where there are false conceptions only; but that the strength of the woman must be preserv'd, by observing the state of the flux, and moderating it according to occasion; and, at the same time, by keeping the patient quiet both in body and mind, and nourishing her with aliments suitable to her condition.

While these things then were observ'd with attention, not many days after, when the patient happen'd to be standing (which was on the eighteenth of August) the waters suddenly broke forth from the uterus, not differing in their smell, nor in any other circumstance, from those which generally are discharg'd by women in labour; except perhaps that they were discharg'd in somewhat larger quantity.

The midwife being immediately call'd, and finding no signs of an approaching birth, besides this eruption; and even perceiving, with her finger, the os uteri to be shut; took care we should be inform'd of these things: and we answer'd that unless any thing new should arise, we must in the mean time lie still and do nothing.

One, two, even three, days were pass'd over in this manner. I not being greatly surpriz'd at it, as I remember'd not only to have read the same in Harvey (*r*), and many other authors, but also to have seen in another noblewoman, and fellow-citizen of mine, the discharge of the waters long before the latter part of utero-gestation; the birth not succeeding, nevertheless, till the proper time, and being happy; yet I was somewhat displeas'd with the accident in this case, where I suppos'd the foetus to be neither robust, nor solitary.

But on the fourth day, when the belly, which had been much sunk by the discharge of the waters, was again somewhat more elevated, labour-pains came on: the mola was first excluded, and after that the foetus in a lifeless state; and last of all, after the interval of three hours, the secundines came away not without difficulty, and a great profusion of blood.

The mother was preserv'd, and died nine and twenty years after, of a malignant ulcer, as I have heard, in the uterus or vagina; but one which had begun in these later years.

At least, at the time she was pregnant with this foetus, and even in the time that succeeded her delivery, and for a considerable length of time afterwards, there was no symptom from whence you could justly suspect any ulceration of the uterus, or vagina; and from thence account for those effusions of blood; as you might in a woman describ'd by Raygerus (*s*), since she labour'd under a very great uterine hæmorrhage first, together with very severe pains of the loins, and groins, six or seven weeks before her delivery; and after her delivery, and time of child-bed, was afflicted with a profluvium of

(*r*) In additam, ad exercit. de generat. ubi de uter. humor.

(*s*) Eph. n. c. dec. 3. a. 3. obs. 135.

very foetid and black matter, by which she was waisted away within a very few months.

But if you choose to compare our case with those propos'd by Phil. Jacob Hartmann (*t*), and by the celebrated Guttermann (*u*); you will easily conceive that abortions, which are, in like manner, join'd with a false conception, have been preceded by a very great, and very long, profusion of blood; and yet that this is not, and could not, with propriety, be attributed to a blood-vessel being open'd in the vagina, and much less to the ulceration of the uterus, or vagina.

But let us go on to consider the other circumstances relative to the abortion. I have describ'd.

The mola being wash'd from the blood which adher'd to it, was found to be no thicker than two fingers breadths; but somewhat longer; and when cut into, appear'd to be a little spongy, and in a manner fleshy.

The secundines show'd no disorder at all. The foetus, which was of the female sex, was not equal in its length to nine inches. The whole of the head and neck was blackish, as if from a large contusion; but without any ill smell. The other parts, even internally, had no preternatural appearance, as far as I could see.

For, by reason of the foolish moroseness of the women, I was but just allow'd to open the belly, in which I observ'd the stomach, and some of the intestines, to be not empty, from what they naturally contain'd of a blackish colour.

But they would not even have permitted this, except for the sake of comforting the parents; who, being deceiv'd by the appearance of the sex, were greatly chagrin'd at their having lost a boy; for I show'd them the uterus, which was very small indeed, but very evidently communicating with the rimula of the pudendum; as I demonstrated to these curious parents; according to my promise, by introducing a slender probe through the external passage; for the pretty prominent magnitude of the clitoris, covering over the rimula, as is usual in foetuses of this kind, had impos'd upon them for a penis: nor is this surprizing, since it has often impos'd upon surgeons, and even physicians, in the same manner.

10. And you will know that this is not said without reason by me, when you observe that the author of both the speculations upon viviparous generation, describes a foetus in one of them, which, "having scarcely attain'd to the length of a third part of the little finger, was nevertheless compleat, and distinct in all its parts; so that even the masculine sex was extremely well distinguish'd."

For he would not have fallen into this error; which these words extremely well, without any mention of doubt, or of a more accurate examination, plainly show; if he had been more studious of exercising himself in anatomy, than of opposing it; and had observ'd the same things that skilful anatomists, and particularly Ruysch (*x*), have taken notice of, in regard to the deception in distinguishing the sex being more easy, for the reasons I have said, in proportion as the foetus is less.

(*t*) Dec. ead. a. 4. obs. 84.

(*u*) Aët. n. c. tom. 3. obs. 78.

(*x*) Theat. Anat. 6. n. 48. 51. 54. 59.

It concerns parents to have this vulgar error extirpated, as they very often suffer the more chagrine on account of an abortion, because they think those to be the abortions of males also, which are in fact the abortions of females.

But to return to the history in question, whether that blackness of the head, as if from a contusion, was owing to this, that the waters being altogether, or in the chief part, effus'd, the membranes were not distended thereby; and therefore not push'd downwards in order to dilate the passage for the foetus; but the foetus being propell'd by the efforts of the mother, was oblig'd to open a passage for itself through the streights of the os uteri; or rather whether, if the foetus is suppos'd to have been previously dead, which was certainly the case, it might have contracted an injury of that kind, (to which only living bodies, or recent carcases, are liable) long before; whatever the cause of this might be; or immediately after, death, the head being probably turn'd downwards before; and, in like manner, whether the mola is to be accus'd, which, as it preceded the foetus, might have been interpos'd betwixt the head of it and the os uteri, and have made the way more narrow; and might likewise be the obstacle which, when the woman was in a standing posture, prevented the discharge of blood from the uterus, as it seem'd to be then press'd upon the orifice from above; I leave quite undetermin'd.

And I do not doubt, but the waters which were effus'd, came from the amnios of the same foetus, which was not excluded till the fourth day after for several reasons; but particularly because they seem'd to be in somewhat greater quantity, than they ought naturally to be.

Nor am I ignorant of its having been ingeniously suppos'd, that the waters which are discharg'd before their proper time, do not belong to that foetus which is, at length, protruded; but to another: which having been conceiv'd together with this indeed; but extinguish'd in the first dawns of life, and afterwards colliquated; has left the waters that anticipate the discharge, within its own proper amnios, till, by their continual increase, this membrane is so distended, that it can no longer resist the pretty vehement motions of the other foetus; which is strong, and almost arriv'd at a state of maturity.

But not to dispute here, upon that increase of the waters, and moreover, to grant that there may, perhaps, be some room for this hypothesis in some cases; at least there certainly was not in our case; inasmuch as the foetus was imperfect and weak; nor yet in those propos'd by Peterfonius (y) and De-thardingius (z); for the foetus which is said to have drawn back, into the uterus, its head which was already thrust out, and to have remain'd there; the one two weeks, and the other seven; till they were intirely excluded at the time of birth, had certainly open'd a passage for their own waters, and not for those of others: or if these instances requir'd more firm proofs, which I readily confess; yet others more easy to be believ'd, and relative to the same subject, will not be wanting, if you should have leisure to inquire after them.

However, I am wont, for the most part, to account for that discharge of

(y) Eph. n. c. dec. 1. a. 1. obs. 62.

(z) Earund. dec. 3. a. 5. in append. n. 8. ad cit. obs. 62.

waters, which is premature, and generally harmless, from the rupture of the chorion alone; which by this means suffers the water, that was, perhaps, collected betwixt itself and the amnios, in greater or less quantity, according to the observations of Ruyfch (*a*), and of others (*b*), to flow out; although these persons have, from thence, feign'd to themselves I know not what kind of allantois in the human species.

But that the eruption of waters, before their proper time, which Hippocrates (*c*) with reason pronounc'd "bad," is from the amnios itself, I do not in the least doubt. Although the birth is not always unhappy after this: yet it is generally less happy than it would otherwise have been, whether we consider this as a cause, or as an effect.

For considering it as a cause, the water, being effus'd, does neither then properly dilate the passage for the fœtus, nor lubricate it. And as an effect; whether it be from the membranes of the secundines being not quite firm, or from the too great quantity of water, or finally, from the acrimony of it (in which light Martianus (*d*) chooses rather, and not without justice, to consider it, when he teaches us how to distinguish these two last from each other) it certainly does not foretell any thing good, in respect to the constitution either of the fœtus, or of the mother, or both, in their solids, or fluids, or both; contrary to what is requisite to the desir'd happiness in child-birth, and in child-bed.

From these considerations it will be easy for you to explain some things relating to the eruption of the water, and to the other circumstances, in the case of the matron in question; in her delivery, and in the fœtus.

And as to the signs which induc'd me to suspect a false conception, you gather these from the history, where, such as they are, I have taken notice of them. It certainly is not so easy to know that it is present, as to allow us to affirm it with boldness: yet from the known signs which our ancestors have left us, we may suspect it with prudence.

The greater part of these; though it is not necessary that all of them should occur together; you will see collected by Lamzwerdius (*e*), from whose book, otherwise in the greatest part of it quite barren, I have observ'd them to be describ'd by some authors, in this age, without mentioning his name.

Yet I did not suppose that mola, either before delivery, or after dissection, to be one of those that are call'd the true; and even always consider'd it as a polypous concretion of the uterus, particularly in a woman (and this circumstance induc'd me still more to suspect its existence) from whose uterus I saw so great a quantity of blood was discharg'd; and found that this blood was so prone to concretion.

II. Without doubt, though some of the molæ are true, and others that are so call'd are spurious; yet some of both these kinds may be either join'd with a fœtus, and often cause abortion; whether by irritating the uterus, or

(*a*) Thes. Anat. 5. n. 56. prope fin. & thes. 10. n. 155.

(*b*) Vid. Littré Mem. de l'Acad. R. des Sc. a. 1701. & Commerce. Littré. a. 1732. hebd. 36. n. 3.

(*c*) Coac. prænot. sect. 3. vers. 187.

(*d*) Annot. ad eund. vers.

(*e*) Hist. Nat. Molar. uter. c. 16.

by occupying a very considerable part of its cavity; or increase to such a degree, without a foetus, as to resemble pregnancy.

But the illegitimate, or spurious, may be produc'd even in untouch'd virgins, and chaste widows; the legitimate, or true, cannot, unless among those, who, contrary to the opinion of others, suppose *ova subventanea*, or unimpregnated eggs, in women.

The spurious; to speak of these first; are form'd either of blood stagnating in the cavity of the uterus, or of some internal excrescence thereof. You will know these latter by a certain basis, or peduncle, by which, as Ruyfch (*f*) has advanc'd, they are continued from the uterus, or at least come off from the sanguiferous vessels thereof, which are produc'd into them.

But the former, which occur much the most frequently, and to which you will, without difficulty, refer many that are extant in the Sepulchretum, are compos'd merely of blood; in the same manner as other polypous concretions are form'd in the vessels, and in the heart itself: and I do not see sufficient reason, why we may not allow it possible, as Lancisi (*g*) has taught, that these may be form'd even in the uteri of virgins, contrary to the opinion of Hoffmann (*h*); especially in the uteri of those whose menstrua flow in great plenty, or to whom a uterine hæmorrhage is not unusual; for in this, or some similar manner, do I think that the celebrated Abraham Vater (*i*) is to be interpreted; as he allow'd of them in *some* virgins at least.

Ruyfch (*k*) has taught us, by what means concretions of this kind may be distinguish'd from certain molæ, which have, by others, been reckon'd among the true ones; and this notwithstanding they have something join'd with them that has a resemblance to membranes. But before I begin to expatiate a little upon molæ, I must not conceal from you, an observation of mine of a certain singular conformation of polypous concretions of the uterus.

12. In the place of my nativity was a noble matron, of a tall stature, endow'd with a good colour, and a laudable habit of body, who had suffer'd several miscarriages in the first months of her pregnancy; but in the intervals of these abortions, however, she had frequently completed her period of utero-gestation, and brought forth very large living children, and even sometimes twins; thought not without great difficulty, and troublesome times of child-bed.

Betwixt these difficult births she had, for the most part, been subject to a fluor albus of an innocent nature; and, sometimes, in the midway betwixt her menstrual purgations, to a slight stillicidium of blood also, which the embraces of her husband, especially when rather more violent, renew'd: and not without some considerable pain.

This woman then, when she had pass'd about her thirty-fourth year, being intirely rid of her fluor albus; began to labour under a new kind of disease at intervals, which recur'd frequently, within the space of two years: but in the three last months of the year 1723, and the first of the following year, in which month I was consult'd by letter, it return'd at a certain time; that is at the time of the menstrua.

(*f*) Cent. obs. anat. chir. 58.

(*g*) Epist. ad Mulebacher.

(*h*) Dissert. de ignor. uteri struct. §. 19.

(*i*) Diff. qua mola pregnant &c. thes. 12.

(*k*) Cent. citatæ obs. 29.

For at that time pains, like those of child-birth, coming on; and the flux of blood beginning on the first or second day, and flowing even more plentifully than usual; in almost the middle of its course a membranous body, as it appear'd, was discharg'd from the uterus: and that in such a form, and of such a magnitude, as perfectly corresponded to the triangular cavity of the uterus; being moderately convex externally; on which surface it was unequal, and not without many filaments that seem'd to have been broken off from the parts to which they had adher'd; but internally hollow; on which surface it was smooth, and moist, as if from an aqueous humour, which it had before contain'd, but had discharg'd, at its own exit, by an ample foramen, which was in one of its angles, that had been readily open'd by rupture.

The exclusion of this body was follow'd by a great quantity of the lochia; and those were often interrupted according to the custom of women. And if this body came away sometimes, not in an entire state, but divided into little pieces, and at different times; then the pains, and the flux of the lochia, were in like manner renew'd at these times.

As the patient therefore, in each of these four months, in which she had abstain'd from the embraces of her husband, had suffer'd one of these very troublesome kind of abortions; and the remedies which had been prescrib'd by many excellent physicians, who had been consulted, had been of no use at all; she began to think that it would be much more advantageous to her, if she could be free from the pains for nine months at least; and determin'd to lie alone no longer: wherefore in the month of March 1724, she became pregnant. Yet she did not carry her fœtus beyond June.

But this was the consequence of it; that in July, and the two following months, her menstrua flow'd properly, and without any uneasiness.

However, as none had appear'd in the month of October, the pains return'd again about the beginning of November, with the discharge of such a body as I have describ'd; and with the other circumstances I have spoken of above.

And the same symptoms continued to return a long while, at stated intervals; so that when I was at Forli, in one of the following years, I saw a body that had been discharg'd, which, as I had written to them when absent, was made up of a polypous concretion resembling a membrane, and dispos'd into the form of a small triangular purse: so that it was easy to conceive, that the viscid particles of the serum of the blood, issuing forth from the uterine orifices of the vessels, which had been formerly discharg'd in the form of a fluor albus, were now become more viscid, and adher'd to all the internal parietes of the uterus, and by this means were concreted into a polypous membrane; and being moulded to the figure of that cavity (which, in the *Adversaria* (1), I have affirm'd to be almost of the figure of a triangle) as if taken from a real mould, resembled a purse, into which the watry part of the serum, that had been betwixt those more viscid particles, being express'd, was retain'd; preserving the purse hollow, and rendering it internally smooth: and that they were retain'd with ease, because, either on account of the fasciculi of fibres that protuberated within the cervix, or on account of the narrowness

(1) I. tab. 3 & IV. animad. 42.

of this part, if compar'd with the fundus, or by reason of the impediment of the orifice, which was almost close, the viscid particles stagnating, and being every where contiguous to one another, shut up the purse from the very beginning: and finally, that this, at first, by opposing an obstacle to the blood which was about to burst out every month, caus'd the vessels of the uterus to be distended, and pains by this means to be excited; but after that, when by the force of the impelling blood, it was drawn away from the parietes of the uterus, it increas'd the pains and made them violent; and last of all that being torn quite away on all sides, it was thrown out of the uterus, not without a great quantity of blood preceding, accompanying and following it, on account of that great distention of the vessels.

Thus you have the opinion that I had of this disease, in the beginning, and afterwards: which disease, to me who remember'd the observations of Platerus (*m*), and of others, and those which were not unknown even formerly to Aetius (*n*), seem'd by no means new, in this circumstance, that, at the stated time of the menstrua, some concretion should be discharg'd, and that for a long time together; but in this, that the concretion was of such a peculiar form, which I do not remember to have read of in other authors: and indeed I remember Platerus to have expressly asserted, that he could find "no cavity" in his concretion.

To some of those who were consulted, this of ours seem'd to be an excrescence of the uterus; to others a polypous concretion indeed; but from blood distilling through some eroded vessel, in the uterus itself.

But if they had either inspected it, as I did, or had read the description thereof, in the letters written to me by this lady's husband; which were much more accurate than those of the physician; I doubt not but they would readily have laid down those opinions, which time, also, shew'd to be foreign to the truth.

For although the disease lasted a long while afterwards; yet it at length ended of itself, and through the effects of age.

That is to say, when the time was come, in which the menstrual purgations generally leave women, it now first began to return, not every month, but only twice, or thrice, every year: and when the menstrua entirely ceas'd, it ceas'd also: nor did any sign of even the most slight erosion in the uterus, or any inconvenience therefrom, exist during the whole life of the woman; and she liv'd until a cancer, which arose in one breast afterwards, carried her off when on the verge of seventy years of age.

Moreover, the opinion of the physician, whom this patient made use of, was that these concretions were unimpregnated eggs; considering, I suppose the same thing that they did, who have taught us to distinguish polypous molæ, from those which are from such eggs, by the cavity which would be within these latter, and not within the former.

But if we were even to allow of such eggs in women; it would nevertheless be difficult to say, why, in this woman, they should always be drawn

(*m*) Obf. 1. 3. ubi de inanimat. excret.

(*n*) Medic. Tetrabi. 4. ferm. 4. c. 80.

out into the form of a triangle, and why in each month, one should be ready to descend into the uterus at a stated time.

But thus far on this subject. Now let us add a few things upon true molæ, as I have promis'd.

13. The most learned men of our age only call those molæ true, or legitimate, which are not produc'd without a previous conception. But some believe that they may be form'd of the fœtus, and secundines; others of the placenta only; if from any cause whatever, the appearance of these parts are chang'd, so that they cannot be readily known to be those, which from the original formation they had been; whether they represent a kind of fleshy mals, or even a mass much harder than flesh; or a congeries of vesicles; as that which Mercatus (*o*) saw formerly.

You have Ruysch in your hands, who has shown, even in the placenta alone, both these kinds of changes; and that in several places, but particularly in his observations: and as these were publish'd in the year 1690, I do not see why none of them, that I have refer'd to here or above (*p*), are transfer'd into the Sepulchretum; at least to increase the scholia of this section.

For he has taught us (*q*), that the placentalæ, of very small fœtusses, frequently remain in the uterus; and being compress'd by the uterus constringing itself more and more, seem to be very different from what they were; and not only in figure, but also in their substance, which is very similar to the most hard flesh.

And that the placentalæ of pretty large fœtusses, remaining in the same cavity, sometimes degenerate into vesicles full of a watry humour, the same author, if any other, very clearly shows; since he found one and the same placenta in part found (*r*), and in part already chang'd into vesicles of this kind.

But notwithstanding these observations are true, three or four things, however, ought to be added.

First, that the placentalæ of the smaller fœtusses do not, however, fail to degenerate sometimes into vesicles; as the same author Ruysch demonstrated the beginnings of this change in the placenta of a fœtus "of almost three months;" and in another "placenta shew'd the same change still more clearly" (*s*).

In the second place, that this change does not agree with the placenta alone; since it is certain, not only from the later observations of Ruysch, that he had seen a vesicle "many times" in the funiculus umbilicalis (*t*); but it is even manifest, from his more early observations (*u*), that the same funiculus had sometimes occur'd to him in a state so full of "vesicles, that the whole of it seem'd a concatenation of vesicles fill'd with a watery humour:" and it is even certain from the observation of our Vallisneri (*x*), that a placenta was discharg'd from the uterus, after a very great number of vesicles, so that;

(*o*) Sect. hac Sepulchr. 37. obs. 1. §. 4.

(*p*) N. 11.

(*q*) Obs. 28. 29. 58.

(*r*) Obs. 33.

(*s*) Thes. anat. 6. n. 102. 103. & tab. 5. fig.

(*t*) Ibid. n. 45. & tab. 2. fig. 3.

(*u*) Obs. 14. & fig. 15.

(*x*) Opere tom. 2. p. 1. ubi de Partu Vesicular.

unless you suppose this to have belong'd to another foetus; it would appear that these vesicles, therefore, had not been from the change of the placenta; which you may also infer from the observations of others: as, for instance, from those of the celebrated Guttermann (y).

In the third place, that it may perhaps be doubted with the same Vallisneri, who I see has observ'd nearly all the things that I have observ'd, whether that degeneracy, of the placenta into vesicles, is brought about at the time when it remains in the uterus, after the exclusion of the foetus; or whether it is brought about before this exclusion.

At least, in the placenta of a foetus of four months, which had been excluded together with the foetus, I have seen a vesicle full of water. Yet on this supposition, such a change would be seen more frequently in the placenta, which are discharg'd with the foetuses.

Finally, in the fourth place, as it is said above, that neither of these kinds of molæ are produc'd without a preceding conception, and neither of them, certainly, by untouch'd and pure virgins; that I remember to have read; there is, beyond a doubt, need of the greatest skilfulness, and diligence in examining; nor less prudence in pronouncing; if at any time a woman who is said to have abstain'd herself from man, should discharge a body from the uterus, which, at first sight, might seem to belong to one or the other kind; lest it should perhaps not be a placenta, but a mere concretion of blood, or some excrescence which bore a resemblance to flesh, or the vesicles, whereof I have spoken.

For that excrescences, which resemble flesh, or are really flesh, have been met with at times is very well known: and what they are which bear a resemblance to these vesicles, has been said in the preceding letter (z).

And indeed, as there is sometimes a dropfy in the cavity of the belly from hydatids; as, for instance, such as Ruysch (a) has represented to have been included in a peculiar sac; so it is not repugnant to probability, that a dropfy of the uterus is sometimes produc'd in the same manner: especially as Aetius (b) has describ'd this; unless it is to be consider'd as a mola made up of vesicles, as others have chosen to consider it; in his chapter *De Uteri Hydrope*: his words are, “a quantity of moisture is collected in the womb, and sometimes certain corpuscles, very similar to the gall-bladder, are generated therein, and in these corpuscles a humour is collected:” and these corpuscles he calls below “bladders compos'd of pellicles, and fill'd with water.”

Nor are examples wanting, of a long-continu'd dropfy being solv'd by a very great number of hydatids discharg'd from the uterus; one of which kind you will read propos'd by the celebrated Kannegießerus (c), in an old woman who was about seventy years of age: although there may be some who suspect, that, in this case also, these hydatids belong'd to a true mola; that is to say from the placenta of the foetus, conceiv'd while the age of the woman as yet allow'd of it, and carried in the uterus many years after the death of the foetus.

(y) Aët. n. c. tom. 3. obs. 78.

(z) N. 20. & seq.

(a) Obs. cit. fig. 24.

(b) Med. Tetrabibl. 4. Serm. 4. c. 74.

(c) Aët. n. c. tom. 6. obs. 89.

Which I take notice of for this reason, because the celebrated Rideux (*d*), in regard to the mola of another kind indeed; but of the legitimate kind, as he does not doubt; which was discharg'd by a widow in the seventy-seventh year of her age; although of such a magnitude and weight, that it is surprising, no signs of its existence had ever been given; thinks, nevertheless, for those reasons which he gives, that it had its origin from a conception of the woman, when she was in her fifty-fourth year: that is in the year when her menstrual purgations, being not at all diminish'd quite to that time, ceas'd of a sudden: and she had brought forth her ninth child in the fifty-first year of her life.

And these things being suppos'd, you may gather two useful inferences from thence. One, that we may consider, whether you can from hence explain, or at least in some measure, how the woman of whom you read in Vallisneri (*e*); who was herself also the mother of many children; the last of which she was suppos'd to have brought forth almost in her fiftieth year; in the seventy-second year of her life at length discharg'd a placenta from the uterus, and, annex'd thereto, a mass, weighing a pound, of rude, and unform'd flesh; if you except a kind of similitude to an eye in the upper part; and certain involutions within, as if of the intestines of a foetus: and, in like manner, how another woman (*f*), older by a year than the last; who had formerly had her menstrua return, and been impregnated, and had them return now again for one month or two; discharg'd "veins;" if they were really veins, and could preserve their form so long; together with a much larger mass of flesh.

And the other useful inference is, that if any thing of this kind should come from any widow, even long after the death of her husband, which comes near to the nature of a true mola, and even is a true mola; we must not immediately doubt of her chastity: since, as has been said above, the placentula might have remain'd in the uterus formerly, in an abortion that had not been much taken notice of.

And though these things by no means take place in virgins; yet even in them, as I said, we must consider again and again with accuracy, and take care that no deception may happen.

And that this may be avoided as far as possible; it will be proper to attend to those things, in fleshy excrescences, and in polypous concretions of blood, which are taken notice of above (*g*), and to read over the places of Ruysch that are refer'd to; and indeed to add the observation of the celebrated Schlierbachius (*h*), who; although he saw a mola "in some measure vascular, and, at the same time, fill'd with copious hydatids, that seem'd interlarded with a great quantity of fat;" did not for this reason deny that it came from a virgin; I suppose because even in polypous concretions there is often an appearance that in some measure resembles fat; and we sometimes see those appearances that resemble vessels: as to hydatids, I spoke of them just now.

(*d*) Mem. de l'Acad. R. des Sc. a. 1735.

(*e*) Tom. 2. cit. p. 2. c. ult.

(*f*) Eph. n. c. cent. 6. obs. 74.

(*g*) N. ii.

(*h*) Act. n. c. tom. 7. obs. 61.

Thus Phil. Jac. Hartmann also (*i*), did not suffer himself to be deceiv'd, either by the appearance "of a fat cuticle," or by "many coats intermix'd with fibres, and vessels, of a white colour;" or, finally, by "a vesicle inherent internally, and containing a jelly;" but acknowledg'd it to be nothing more than "a coagulum of blood:" notwithstanding it was in a woman, in regard to whom, if he had said that it was a true mola, he would, from thence, have brought no reproach upon her honest fame; as she was a married woman.

We must therefore inquire, not what appears, but what really is, and that with accuracy; for true fibres, true vessels, true coats, and a bladder made up of these, cannot exist without the interposition of a man.

Nay, even a bladder of this kind, would be the most legitimate among all molæ; as it is the involucre of the beginning of an embryo, and of the humour in which the embryo swims; if a thing of this kind were comprehended under the name of a mola, as it is now understood by most persons: although the same Hartmann (*k*), and the celebrated Gotwaldt (*l*), in imitation of him; the last of which authors has illustrated his observation by a figure, very similar to those that were publish'd afterwards by Ruysch (*m*); have call'd this very appearance "a mola vesicularis," or bladder-like mola.

This, therefore, cannot exist in virgins, nor, as far as I know, that in like manner, which might with more propriety be call'd a "mola vesicularis;" I mean a congeries of vesicles dispos'd after the manner of a cluster of grapes.

And lest any deception should happen in judging of this, it will not, I believe, be useless to inspect the most accurate descriptions, and representations by figures, of those which have been discharg'd after conception; and to attend to the branches, or ramifications therein, to which they have often hung when discharg'd.

Descriptions and figures of this kind, you will not find in so perfect a state in Ruysch (*n*); although he has represented the vesicles more than once, and has mention'd them many times; as in Malpighi (*o*), and Vallisneri (*p*).

And certainly, those small excrescences which are made up of vesicles, and which I have happen'd to see within the uterus, had no appearance of branches, to which the vesicles were hung; but were crouded closely to each other, and coher'd either by their own substance, or by means of an interposing substance, which was neither slender, nor ramifying.

14. However, there are so many observations publish'd, of bladders being ejected from the uterus; and so many collections of those refer'd to by men of erudition; that I should seem to be undertaking a very useless labour, if I should add, at large, any others that have come to my knowledge.

For I know that a matron of Forli, about forty years ago, discharg'd vesicles, some of which were larger, others smaller, and some very small; and that here likewise, the wife of one of the governor's servants discharg'd, in

(*i*) Eph. n. c. dec. 3. a. 5 & 6. obf. 206.

(*k*) Earund. dec. 2. a. 10. obf. 157.

(*l*) Earund. dec. 3. a. 9 & 10. obf. 159.

(*m*) Thef. Anat. 6. tab. 2.

(*n*) Advers. Anat. dec. 2. c. ult.

(*o*) Op. Posth.

(*p*) Opere loc. cit. & Eph. n. c. cent. 9. obf.

the year 1727, a great number, instead of a foetus that was expected; and that Albertini, about the beginning of the year 1724, had, once and again, at the distance of a month, seen a congeries of vesicles discharg'd from a certain woman (not without some fever and severe pains) which resembled the larger branches of the red currants in their figure and disposition; except that they were of a colour somewhat more dilute: nor indeed does the colour show that those vesicles were different from others which we speak of; since not only Tulpus (*g*) has not doubted that some, which were distended with "a yellow water," but Lancisi (*r*) also, that others, which were on one and the same branch, among the rest that were full of a limpid, or yellowish fluid, and were distended "with a kind of redish cruor," belong'd to this class; nor yet those celebrated men Magnenius (*s*), Dechiappa (*t*), and Guttermann (*u*); the latter of whom in some of the largest, and the second in all; for they were all pretty large; saw "a bloody" or "redish spot" internally: but Magnenius, in another mola, saw some "of a yellowish colour;" and two only or three externally "redish;" and in another, of the same woman, found all them; which were innumerable and very small; "of a very red colour."

To these observers you will finally add the illustrious Haller, where (*x*); describing white vesiculæ, which adhered to stalks going out from the placenta; he says that in the placenta itself also, "there had been more red vesicles, which were connected to each other in the same manner."

I omit others, in which nothing is remark'd that has any reference to a red colour; whether the bladders have been discharg'd from the uterus, in a loose and unconnected state; as those probably were, that are mention'd in the *Commercium Litterarium* in the year 1745 (*y*), and certainly, if I am not mistaken, those that are taken notice of by the celebrated Phil. Conrad. Fabricius (*z*); or not in this free and unconnected state, but dispos'd in a confus'd order; as those which are describ'd by the celebrated Wogan (*a*); or, at length, whether they are "collected like clusters of grapes;" as those which were seen by the celebrated men Jo. Sebast. Albracht (*b*), and Jo. Jac. Treyling (*c*): to which class almost all those belong'd that I spoke of just now.

A great number of the same kind have also been brought to me sometimes; especially, in the year 1716, those which a woman of Verona had discharg'd, after the exclusion of a foetus, by a violent abortion.

These I examin'd together with him that had sent them, Vallisneri. But as for the same reason, I suppose, that has been mention'd; I mean the very great number of histories of that kind already given; he did not, as far as I know, publish this observation, I shall likewise pass it over.

I shall rather add what a kind of incipient mola vesicularis, I found in the uterus of a bitch, in the year 1723; for there are not so many histories ex-

(*g*) Obf. Med. 1. 3. c. 32.

(*r*) Epist. supra cit. ad n. 11. quæ prima est apud Vallisner. Ist. della Generaz. p. 3. c. 3.

(*s*) Act. n. c. tom. 1. obs. 166.

(*t*) Ibid. obs. ead.

(*u*) Obf. cit. supra ad n. 9.

(*x*) Opusc. Pathol. obs. 40.

(*y*) Hebd. 33. in fine.

(*z*) Propempt. ad Diff. I. B. Hoffmanni, not. c.

(*a*) Eph. n. c. cent. 9. obs. 85.

(*b*) Comm. Litter. a. 1738. hebd. 28. n. in fine.

(*c*) Act. n. c. tom. 5. obs. 134.

tant, of a mola of this kind seen in the uterus, as when discharg'd therefrom: and it must be that molæ are more rare in brute animals, than in women; since not only Aristotle (*d*) has said that they “are either generated in women alone, or in women chiefly;” but also, among the more modern writers, Harderus (*e*) denies his “having seen any thing of this kind, that was discharg'd from the uterus of a brute;” and requests of others, “that if they have found any appearances of this kind at any time, they do not withhold the relation thereof from him and the public.”

It does not escape me, that in the eggs of hens, whether excluded, or inherent in the ovaria, molæ have been found; as by Vallisneri (*f*), and by Gotwaldt (*g*).

And in those brute animals that they call perfect, of which Harderus seems to speak, I do not deny, that there may perhaps be examples which are more clear, in the beginning, than this that I am about to produce: at present however, I do not remember to have read them: and although a very learned man says, “that Vallisneri had describ'd a mola vesicularis, even in a cow;” he perhaps meant to say in a bitch, in which animal he did really describe (*b*) one; but one of such a kind that he himself has confess'd it “difficult to judge, whether it was not some preternatural production from the substance of the uterus.”

15. A little bitch which had brought forth young several times, but not more than two at each birth; having, a month before, copulated with a dog, was suppos'd to have become impregnated: at last having seem'd to be sad, and melancholy, for some days, she was suddenly seiz'd with convulsive motions, and died without any howling. The master of the bitch; who was a learned man, and an intimate friend of mine; came to me on the day following, and beg'd of me, that if it was convenient I would inquire into the cause of the creature's death: which I immediately did, in the presence of him, who had order'd the carcase to be brought, and others who were skill'd in dissection.

The lateral ventricles of the brain, and especially the left, contain'd a great quantity of water; which the redness of the choroid plexusses shew'd to have been effus'd there not long before death.

The cavities of the heart were full of blood almost coagulated, and very black.

The membranes of the belly in particular; for they were fat in other places; were loaded with so great a quantity of fat, and chiefly about the uterus, that I could not demonstrate the whole slender tract of both tubes.

The testes, although near to one of them hydatids were seen, had no vesicle such as they generally have in a natural state: nor was it to be wonder'd at, since the whole of them seem'd to be in a manner fleshy: that is to say, from the bodies which we call corpora lutea, in cows and in women, being contracted.

(*d*) De Generat. Animal. l. 4. c. 7.

(*e*) Eph. n. c. dec. 2. a. 2. obs. 185.

(*f*) Opere tom. 1. p. 3. pag. 126. & tom. 2. p. 212. n. 16. & pag. 240. n. 9.

(*g*) Eph. n. c. dec. 3. a. 9 & 10. obs. 157.

(*b*) Opere tom. 2. p. 2. vers. finem.

Yet the cornua were both of them tortuous in their passage: and in several places more or less protuberant; although not so much dilated into distinct cells in any part as I have been us'd to see in bitches, that had been pregnant for some time.

The whole internal surface thereof was tender to the touch, and red. But in those places where larger protuberances, than the rest, appear'd externally, a thick humour was contain'd, of a mucous nature, and of a white colour mix'd with green; so as to resemble pus; being inodorous, and showing no primordia of the foetus.

This humour was surrounded by a kind of soft and redish substance, wherein vesicles full of water discover'd themselves; these vesicles being of a different magnitude, but all small in their size, and not very numerous in their quantity.

16. Among the other causes of false pregnancy, I see that, in the Sepulchretum, after molæ, other tumours of the uterus are with propriety reckon'd; and not only of the uterus, but of some other parts of the belly also.

Of the uterus, whether they be from internal or external excrescences, or from humours in the parietes of that viscus; or even stagnating in the cavity thereof; when the passage of the osculum outwards is shut up by any cause that either constricts, or obstructs, it. And of some other viscera, and of the mesentery in particular. Upon all which subjects as I have in general written more, or less, on former occasions; it is not necessary to repeat the same here.

But I will rather dispatch that question, which I remember you ask'd of me; I mean when, and how, by reason of one kidney only being created in such a manner, from the first original of the body, the belly may be prominent, so that even an anatomist may be deceiv'd; and take this prominence for an utero-gestation? For that this has been advanc'd, among the other causes "which resemble pregnancy," in this section of the Sepulchretum (*).

Although I foresee, that I must enter into so much more prolix a discourse than you imagine, that I may seem, to you, to have digress'd from the intention of this letter; yet I shall do it willingly: and that not only because if I miss this opportunity, I shall have no other proper occasion of satisfying your request, but because I shall endeavour to reduce into some order, almost innumerable observations of the kidney alone; which reduction I shall endeavour to make as useful as possible.

But it would certainly have been much more easy for me to have satisfy'd you now, if those who collected examples, after Pinus (**), of one kidney alone being found, Schenk (*i*), Bauhin (*k*), Riolanus (*l*), Panarolus (*m*), Rhodius (*n*), Hornius (*o*), Blasius (*p*), Francus (*q*), Hilscherus (*r*), and others after them, had, every one of them, given those that were already publish'd

(*) XXXVII. Vid. titulum. obf. 3. prefix. ad n. 6. qui pro n. 7. ibid. ponitur.

(**) Annot. ad pag. 51. 8. Opusc. Anat. Eustach.

(*i*) Obf. Med. Rar. l. 3. ubi de Renib. obf. 2 & 3.

(*k*) In Notulis ad Theatr. Anat. l. 1. c. 22.

(*l*) Anthropogr. l. 2. c. 26.

(*m*) Jatrologiū. Pentec. 1. obf. 3.

(*n*) Mantiss. Anat. obf. 32.

(*o*) Annot. g. ad Botalli. obf. anat.

(*p*) Append. ad Bellin. de Renibus.

(*q*) Eph. n. c. dec. 3. a. 5 & 6. obf. 176.

(*r*) Prolus. de unico reperto Rene.

in their times; as they might easily have done; and had distributed them into certain classes.

But they have omitted some even in books that are in every one's hands: and those they have produc'd, they have generally made a practice of pointing out almost promiscuously; whereas it would not have been difficult to divide them into those wherein one kidney only was form'd; and into those where one kidney, to appearance, was made up of two; and the first of these again, into those wherein the kidney occupies the side as usual; and into those wherein, being laid upon the spine, it holds a middle situation.

To those first, wherein the kidney lies on the side; besides the antient examples from Aristotle (*s*), belong those which so many after him, and among these Sphærerius (*t*), and Solenander (*u*), from Mat. Stoicus, Plazzonus, (*x*), with Sylvaticus, in whom it will be better to read them, Haller (*y*), and Petfchius (*z*) have propos'd; and if you choose rather to set aside, on this occasion, my doubt that has been hinted in the fortieth letter (*a*), even Tulpius (*b*), and Meekrenius (*c*).

Which doubt you may set aside in the observation of Hilscherus (*d*): although this may be added, by you, to those that are in the Sepulchretum, on the subject of renal ischuriæ, from calculi; yet to omit other things, sufficient testimonies are collected by the ingenious inquirer, to convince us that one kidney had been wanting from the original formation: just as it was in that professor of Cabrolus (*e*), and in the young man of Manfredi, the little bitch of mine, and the rabbit, all of which were taken notice of by me on former occasions (*f*); and even in the priest, and the woman of Valsalva, and the girl of Poupart.

And there was this proof also, in that woman, of there having been but one kidney from the original formation; I mean that the kidney was furnish'd with two *pelves*, and two ureters: and we not only read that there was the same number in the young man of Panarolus (*g*), and in the foldier of Laubius (*h*); but besides, that one of the ureters had inserted itself into that part of the bladder, to which no kidney corresponded.

To the examples hitherto mention'd, all of which belong to the first class, it is probable that many others may be added; either such as do not occur to me at present (for I never take upon me to imagine that I have either read or remember'd all) or such as the writers themselves have so express'd, as to say that there was one kidney only; as Columbus (*i*), Fernelius (*k*), Caspar Wolphius (*l*), Laurentius (*m*), Boiscus (*n*), and Jo. Scultetus (*o*); who points out both his father's observation and his own; and Salzmann (*p*): and out

(*e*) Apud Schenck. obf. cit. 2. *

(*t*) Ibid.

(*u*) Ibid. obf. 3.

(*x*) Apud Rhod. cit. obf. 32.

(*y*) Opusc. Pathol. obf. 60.

(*z*) Syllog. Anat. Select. obf. §. 77. 78.

(*a*) N. 14.

(*b*) L. 4. obf. med. c. 38.

(*c*) Obf. Med. Chir. c. 40.

(*d*) Proluf. cit.

(*e*) Obf. var. 14.

(*f*) Advers. Anat. 3. Animad. 32. & Epist. 40. n. 14.

(*g*) Obf. 3. cit.

(*h*) Eph. n. c. cent. 9. obf. 16.

(*i*) De Re Anat. l. 15.

(*k*) Physiol. l. 1. c. 7.

(*l*) Apud Schenck. obf. cit. 2.

(*m*) Hist. Anat. Hum. Corp. l. 6. c. 23.

(*n*) De Facultat. Anat. lect. 2.

(*o*) Trichias. Admir. pag. 89.

(*p*) Apud Stehelin. in Tentam. Med. Th. 1.

of the observers who are quoted by those very learned men, Rhodius (*q*), and Haller (*r*); Lopez, Ronseus, Duretus, Handwigius, and Humelius; some have perhaps given examples that belong to this class: I say "perhaps" for this reason, because some of the books referr'd to are not in my hands; and others, as far as I could inquire, do not contain those things that are spoken of; just as I turn'd over the Commentaries of Carpus on Mundinus in vain; for that "other example," as Riolanus (*s*) says, I did not find where it principally ought to have been.

And although most of these authors, of both classes, have said, that this one kidney was large; and even some of them, as Columbus, that it was "very large; as Fernelius, "of a surprizing bulk and magnitude;" as Boscius "of an almost incredible magnitude and breadth;" you are not immediately, for this reason, to suppose that they have spoken of the kidney, which did not belong to the first division of the first class.

For you very well remember, how much either of the kidneys may grow out (*t*): why then may not the kidney, when there is only one, be large in the side? It may even be very large, if the effect of a disease happen to be added; and calculi, pus, and urine, are retain'd so as to distend its substance, as is the case in more than one of the examples produc'd above.

However, do not imagine, that, in saying these things, I approve of what has been asserted by a learned man; that when there was only one kidney, "it had always much exceeded the natural magnitude of the kidney, by the testimony of all observations."

For I do not see this remark'd in all the observations: and, indeed, I see that Panarolus (*u*) expressly admonishes us, "that it had not exceeded its proper proportion" in his; and Valsalva (*x*), in one of his, that it was "of its natural magnitude."

Wherefore, Riolanus (*y*) was less wide from truth, when he asserted that "if one solitary kidney be found, it generally equals the magnitude of both." I wish I could approve of what he immediately adds, "and that it lies upon the back; the canals of the aorta, and vena cava, being a little remov'd, in order to afford a situation for the solitary kidney."

But what a number of examples there are, of a solitary kidney retaining its usual situation, is evident from what has been said above. And as to its lying upon the back, and removing the large vessels (which circumstance has not always been observ'd even then) if all the observers of a solitary kidney had, in general, seen these appearances; they would, without doubt, have noted them down, as not less rare to themselves, than the unity of the kidney which they saw at the same time: but as this has not been done, by those who have taken notice of nothing else but the solitary state of the kidney, I have therefore said above, that it is probable their observations related to the first part of the first class, and not to the second; which, though it is much more rare, Riolanus suppos'd to be the only one: as if it contain'd all the examples of a solitary kidney.

(*q*) Obs. 32. cit.

(*r*) In Access. ad Boerh. Meth. Stud. Med.

p. 7. sect. 4. c. 14.

(*s*) C. 26. cit.

(*t*) Vid. Epist. 40. n. 14.

(*u*) Obs. 3. cit.

(*x*) Epist. 25. n. 4.

(*y*) Encheir. Anat. l. 2. c. 28.

But before I speak of this part, it will be more convenient to dispatch the second class; to which I referr'd not so much the kidney made instead of two, as made of two.

And this I would have you understand, not as if I denied, that, in some of the examples produc'd above, one kidney seem'd to be made up of two; so that it was furnish'd both with a double pelvis, and double ureter; or as if I contended, that, of two kidneys, which were first created in a state of distance, and division, one had afterwards coalesc'd with the other, upon the increase of the embryo.

For I mean nothing else here, but what appears to the first judgment of the sight. Jacobus Berengarius (z) saw this the first, as far as I remember. In a certain man, says he, "the kidneys were continued into each other, as if it had been one kidney: and it had two emulgent arteries, two emulgent veins, and two ureters, with only one involving panniculus: this occupied the usual places of the kidneys, and even the middle of the back, which is in the part betwixt the spleen and the liver, a little below them."

And to the same class belongs that solitary kidney seen by Rondelet (a), which was of the shape of a moon; both the kidneys, without doubt, being in conjunction; and that which Blasius (b) speaks of from Doldius; and that which Riolanus (c) describes as being found by him and "plac'd above the spine the cone being inclin'd downwards, and the horns rais'd upwards."

Nor do I suppose that seen by Piccolhominus (d) to be of a different kind; except that the conjunction was made betwixt the superior parts of the kidneys; as, when "it lay transversely upon the vena cava, and the great artery, its flat and sinuous surface was turn'd downwards, but the gibbous and convex surface turn'd upwards;" such as in figure and position, the illustrious Winslow (e) saw in a monster.

In the other examples, the horns were turn'd upwards, as in the former instances; and in those of Thomas Bartholin (f), and Stalpart (g); who also saw something similar with Nuck (h); the celebrated Haller (i), Verniois (k), and Petschius (l), to say no more of Grasseckius and Bæchius, than what I know from Haller (m); I mean, that one of them "had seen a kidney made by a coalition of two," and that the other "had mention'd a kidney consisting of the two grown together, from the original formation:" and to return to the Italians; Jo. Orontio Azzaritti, a native of la Puglia, formerly my pupil, sent to me, in the year 1721, a description, and delineation, of a solitary kidney; on which he had lit in dissecting a human body at Venice, and which may be compar'd with that of Bartholin, whereto it was very similar: for besides other things, I believe it may show from whence the spermatic arteries, which Bartholin has said did not exist at all, might arise.

(z) Ifag. de Anat. Ventr. Inf. ubi de Renib.

(a) Apud Schenck. obs. cit. z.

(b) Cit. Append. fig. 13.

(c) Anthropol. c. cit. 26.

(d) L. 2. Prælect. Anat. 22.

(e) Mem. de l'Acad. R. des Sc. a. 1740.

(f) Cent. 2. Hist. Anat. 77.

(g) Cent. 1. Obs. Rar. Med. 50.

(h) Ibid.

(i) Opusc. Anat. p. 5. tab. 6. fig. 9.

(k) Comment. Acad. Sc. Imper. Petropol. tom. 3.

(l) Syllog. cit. §. 79.

(m) Accession. ad cit. c. 14. Meth. Stud. Med.

And in the year 1732, Bonazoli (*n*); who was, while living, my friend, and whom I have spoken in commendation of on former occasions also; describ'd a kidney of the same kind.

Finally, I myself in the year 1740, found, about the middle of December, in a girl of six years old, and demonstrated in the hospital, to all who were present; both men advanc'd in knowledge, and students; a solitary kidney: which you may see not inaccurately trac'd out, and drawn at my house, and differing from most others in this circumstance, in particular, that the right lobe was distant from the left by no very great interval; the former being laid upon the latter in the lower part, and divided with a sulcus as it were, which was not very deep however, and only on its anterior surface: so that an isthmus was form'd, which was not less slender than either lobe.

Francus (*o*) is the only one, as far as I know, who saw, and gave a delineation of, an isthmus "of very great vastness and amplitude" as his express words are.

But as he says nothing of the thickness, and even says that each lobe was in that situation the kidneys are wont to occupy; as I understand it to have been in the observations of others, in which, although the whole kidney was very large, it, nevertheless, lay upon the spine only with a very slender isthmus; I was not willing to confound these examples, with those that belong to the second part of my division, to which I now pass on; and which comprehends those examples, wherein the whole body of the kidney was laid upon the spine.

And to this part of the division I shall suppose that to belong, which Carolus Stephanus (*p*) saw, together with Jo. Vasseus; that is to say, "one kidney alone, situated exactly on the middle of the spine; and this very large:" and we may likewise add what Andernacus had said (*q*), "that sometimes "one kidney only appear'd to be connected to the middle of the spine."

And that which is describ'd, and represented in a plate, by Botallus (*r*), and was so large as to seem to be made up of four, is extremely well known.

Nor is that unknown, which Cabrolus (*s*) found, in the servant of the professor, who has been mention'd; "a solitary kidney, but of an incredible bulk, lying upon the vertebræ of the loins:" to which the celebrated Fantonus (*t*), in like manner, saw "a solitary, and very large, kidney, adhering."

To the same class you will refer that which the frequently-commended Halter (*u*) found in a girl of a year old.

And to return to the more ancient writers, and, at the same time, to come nearer to that point, for the sake of which I enter'd into this long discourse; Vesalius (*x*) had written, that sometimes, in those who "have the belly exceedingly prominent, and the order of the ribs vitiated, he had seen a soli-

(*n*) Comment. de Bonon. Sc. Acad. tom. 2.

p. 1.

(*o*) Obs. cit. 176.

(*p*) De Diffect. Part. Corp. Hum. l. 2.

c. 15.

(*q*) Anat. Instit. l. 1.

(*r*) Obs. Anat. 1.

(*s*) Obs. cit. 14.

(*t*) Dissert. Anat. Renov. 7.

(*u*) Opusc. Pathol. obs. 59.

(*x*) De Corp. Hum. Fabr. l. 5. c. 10.

“ tary kidney; and that a very large one; plac’d upon the vena cava, and
 “ the large artery.”

Eustachius (*y*) has asserted, that he had formerly once seen an unusual situation of a solitary kidney of this kind; but “ that he remember’d only
 “ this circumstance very well; that it lay supported on the middle of the
 “ spine, and supplied the deficiency of the other kidney by the increase of its
 “ own bulk:” and he subjoin’d the following words: “ but whether nature
 “ has given one kidney alone, to those, in particular, who have the belly very
 “ prominent, and the order of the ribs vitiated, I confess I am ignorant:
 “ and I exhort those who study anatomy, to observe, with diligence, whether this be true or not.”

From that time I do not remember to have read any author, who attended to this exhortation of Eustachius, when he lit on a large kidney lying on the spine; nor yet when he found the isthmus of two lobes lying transversely thereto.

And even in both cases, I have either found nothing remark’d in the examples hitherto produc’d; or only, that the man being in very good health, he was taken off by the sword, the halter, or a malignant fever; if you except the observations of Piccolhominus and Azzaritti: the former of whom has hinted, that there was a bad constitution of body; perhaps from the isthmus pressing upon the vena cava and great artery, and, for that reason, injuring the function of both; and the latter accounted for an aneurism of that artery, from the same cause; that is an aneurism which had arisen betwixt the appendages of the diaphragm, eroded the vertebræ, and at length put an end to life, by pouring out a great quantity of blood into the left cavity of the thorax.

The isthmus however, for the most part, being but slender, unless it happen to grow thick gradually, or the blood, being immoderately increas’d in its quantity, distend the subjected large vessels, does not generally do so much harm.

I, when in the body of a girl, I found an isthmus not less slender than either lobe; as I have already said; and the lobes not very far distant from each other; as they did not occupy the usual seats of the kidneys; but lay upon the very sides of the vertebræ; did not think that I ought to neglect the exhortation of Eustachius.

However, the abdomen of the girl was not prominent; nor did the course of the ribs vary from its usual order; so that if any person should have been willing, with Vesalius, to deduce the cause of the lobes having been excluded from their situation by the unusual flexure of the ribs forwards; it would have been quite out of his power.

Nevertheless, that the belly was, in this case, but little prominent, was less to be wonder’d at here; as the whole kidney was neither one of the largest, nor had any considerable part of itself laid upon the anterior part of the vertebræ. But I can scarcely believe, that, when a very great bulk of one solitary kidney is superadded to this part, which is of itself so prominent, the belly is not prominent.

And indeed I read that our Plazzonus (*z*) “had suppos’d” that woman, in whom there was a solitary kidney, “to be pregnant at first;” that is before he open’d the abdomen: and I suppose that our Spigelius would have thought, or rather suspected, the same thing also; if it had been a woman, instead of a man, in whom (*a*) “he found a kidney very similar to that woman’s kidney.”

And now you, of yourself, plainly see, although what I said when I was speaking of Plazzonus, is related in this very thirty-seventh section of the Sepulchretum (*b*), among the examples of false pregnancy; that it is not to be understood as being extended any farther than to the suspicion of the anatomist, who is about to dissect the body. For while the woman is living, and interrogated upon the point, the tumour cannot impose upon us for a pregnancy, which did not begin a few months before; but existed quite from the original formation.

But we may be impos’d upon, by one or other of the kidneys being grown very large from disease; not naturally; and fallen down into the hypogastrium.

Thus, in a matron of whom you will read in the history of the Royal Academy of Sciences at Paris (*c*), it might have been taken for a pregnancy of the uterus, which had been of three or four months standing; especially as the menstrua were obstructed; if the age of the woman, her health, and some other things, that follow’d, had not caus’d a different persuasion.

Thus far of false pregnancy.

17. It comes in course now, to speak of abortion; but of this only with brevity. For I have already produc’d three observations thereof above (*d*), when I was speaking of true pregnancy being mistaken for the false: and it were almost endless to recount all the causes of this disorder; whether they exist in the fœtus, or the secundines, or have their origin from the diseases of the mother.

Examples of many of these latter, that pass from the mother into the fœtus, are collected by Frederic Hoffmann; in that dissertation, which, altho’ it is, in general, intitled “of the disorders of the fœtus in the uterus of its “mother,” turns, nevertheless, for the most part, upon those that are communicated by the mother.

We, on the contrary, will speak of those former ones; and yet not of all. But as I have written above of some of the disorders of the placenta; I will now touch upon some that are either causes of abortion; or make that abortion dangerous.

That the placenta, when thicken’d and become hard, may be the cause of abortion, I do not doubt; for at first, by its increas’d bulk, it renders the the space of the uterus too narrow for the fœtus; as has also been observ’d by Cortesius (*e*), where he taught that the placenta “sometimes becomes “very thick and hard.” And the hardness renders it unfit for its office; wherefore the fœtus, being depriv’d of its nourishment, perishes; which Abraham Vater (*f*) confirms by the observation of a scirrhus placenta.

(*z*) Apud Rhod. obs. cit. 32.

(*a*) Ibid.

(*b*) Obs. 3. §. 7.

(*c*) A. 1732. obs. Anat. 7.

(*d*) N. 5. 7. 9.

(*e*) Miscellan. Medic. dec. 9. epist. 3.

(*f*) Diss. supra ad. n. 11. cit. thes. 10.

The same author thinks, that, when the foetus is dead, if the placenta remain in the uterus, and fix'd thereto, it may itself receive the nourishment from the uterus, and by this means become still thicker than it was before: nor is he the only one who entertains this opinion.

But there is, on the other hand, a case; in which, by reason of the interception of the nutriment, both the placenta, and foetus, are extenuated in a surprizing degree: and although this appears, in part, from the observations, of those very celebrated men Hoyerus (*g*), Moekingius (*h*), of a foetus being discharg'd "in a very emaciated state, and with its bulk exceedingly "diminish'd," after great discharges of blood from the uterus; the funiculus umbilicalis, at the same time; being almost destitute of moisture," or "the placenta small and almost juiceless, and furnish'd with little blood; "as their own words are;" yet this is more clearly shown, by the history which was communicated to me, by a physician who was my friend.

18. A certain woman was now in the fourth month of her pregnancy, and just entering upon the fifth, when news was suddenly brought to her of the instant death of her absent husband. Being struck with grief and fear at the same moment, she, from that very time, at first observ'd the motion of the foetus to be made more languid; and after that to cease intirely. And at the end of the eighth day after she ceas'd to feel the child's motion, she miscarried.

The placenta, the dead foetus, and the funiculus umbilicalis were all surprizingly thin and slender. The foetus was quite white: and in the funiculus was some appearance of vessels, but these were almost destitute of moisture.

19. That abortion, which is produc'd by other causes also, often returns; and this at the same interval of time, from conception, that the former had happen'd; as, for instance, at the fourth, third, or second month, from that time; and yet that its return has been prevented by proper remedies, you will learn from Stahl (*i*).

I, however, remember none to have return'd more frequently, than that; which; being first brought on by a great, and sudden, affection of the mind; as I have read in Schulzius (*k*); return'd three and twenty times, always at the same distance of time from conception at which it had first happen'd; that is at the third month; notwithstanding no remedies, that could be suppos'd, by the most celebrated physicians, to have effect in preventing it, were neglected.

You see then, what power passions of this kind have, in producing these effects.

But in the case propos'd by me, I should believe it had happen'd to the uterus, and consequently to the radicles of the placenta, that those fluids which were carried back from the foetus, and the placenta, to the mother, pass'd on with ease; but that those which were carried from the mother, to the placenta and foetus, were not carried without difficulty; as the mother, being so affected in her mind, could neither send sufficient nourishment,

(*g*) Eph. n. c. cent. 1. obs. 51.

(*h*) Comerc. Litter. a. 1736. hebdom. 21. n. 3.

(*i*) Dissert. de Abortu, c. 1.

(*k*) Disput. qua corp. hum. momentan. al-

terat. specim. expend. §. 34.

nor nourishment sufficiently prepar'd, nor driven towards the uterus with sufficient force, at the time when it was necessary, according to the usual course of nature, that every thing in the uterus should be more and more increas'd every day.

There has been, on the other hand, when I suspected, that the extreme tubuli of the little placenta, together with the uterus of the mother, being contracted by the sudden cold of death, the blood was obstructed in its return from fœtusses, that were, in other respects, very healthy; and this blood being collected together in the liver; which was then greatly distended and tender; had made an impetus thereon, and burst forth into the cavity of the belly.

I will here add the observations: you will explain them as you please.

20. A cow had been pregnant with a fœtus for a little time only, as will appear presently, when she was sold by her master who was ignorant of this, and kill'd.

The uterus, and the fœtus, I dissected with care; the latter not being longer than a span, from the upper part of the head, to the beginning of the tail. Every thing was in a natural state; except that blood was extravasated and coagulated about the liver: and that in a considerable quantity too.

21. Another cow was likewise advanc'd two months in her pregnancy, when she was kill'd by the butcher.

Upon cutting open the uterus, and examining whatever was contain'd therein, I found all to be sound; except that the belly of the fœtus was distended with such a quantity of extravasated blood, that before I open'd it, I conjectur'd what would be the appearance, from the blackness that was seen through the extenuated abdomen: and the very tender state of the liver, together with a laceration which it had at one part, plainly show'd from whence this blood had been discharg'd.

22. But whether the same thing happens in fœtusses more advanced, I do not know.

Certain it is that those injuries, which, I have said above (*l*), come to the fœtus, from the hardness of the placenta, are observ'd only in the first months of utero-gestation.

And that fœtusses, which are now strong, and approaching to the time of birth, should perish for that reason; those in particular, who do not doubt but a great quantity of aliment is then taken in by the mouth, will not easily believe; unless the placenta should happen to be made universally hard, or otherwise unfit for its office.

For I think there is no reason to doubt, that the same cause, from whence I have seen it vitiated in any part more than once, may give occasion to a much greater part being vitiated. What I have seen the subjoin'd observations will show.

23. A fœtus that was mature for the birth; whose motion the mother had perceiv'd two days before, but since that had not perceiv'd; was born dead.

The secundines, together with the fœtus, were brought to me about the beginning of June in the year 1731. In them I found this one thing which was preternatural.

When I inspected the hollow surface of the placenta, within the substance of it, at the distance of two inches from the insertion of the funiculus, I saw, through the upper part of its substance, a body of a yellowish colour mix'd with white. And cutting into this, I saw it compacted of thick membranes as it were, some of which were lying upon the others.

As this body was not larger than the last joint of my little finger, there did not seem sufficient reason, why I should impute the death of the foetus thereto; or even that softness which I observ'd in most of the viscera, to such a degree, that not only the liver became fluid at the very touch; but the coat of the kidneys also being incis'd, the substance thereof was effus'd under the appearance of a red pulvise.

24. Twins, that were equally healthy and lively, were born at the proper time of delivery, in the beginning of June likewise, but in the year 1742.

In examining the secundines (which our Mediavia had taken care to have brought to me) with accuracy, I observ'd other things that do not relate to the present subject; and the following that do. One of the placenta (for each foetus had been furnish'd with one, and what happens more rarely they were entirely disjoin'd from each other; and not only the claustrum of the membranes was in like manner perfectly divided, as usual, by a membranous mediastinum) one of the placenta then, not far from the edge of it, had a body, of the diameter of my thumb, going from the convex to the concave surface; so that it might be equally seen from both surfaces.

The whole of this body consisted of a white substance, every where similar to itself, and not more hard than the placenta; and in the other placenta, also, was a body consisting of the same white substance; but only on its convex surface, and not larger than a small vetch.

25. However both of these twins were equally healthy, as I have already said; so that you would not, certainly, conceive the least injury to have happen'd to them even by the large white body.

Let us suppose that these twins had been oblig'd to remain longer in the uterus; and yet whether it was possible then, that these bodies might have been enlarg'd, or have degenerated into that structure, which I have describ'd in the placenta of that other foetus; and, in like manner, whether it was the same kind of disorder; less advanc'd here, and more advanc'd there; or a different one, I confess I am quite ignorant.

A disorder it certainly was, which if you should choose to add to that I made mention of above (m), in describing a certain foetus; you will confess that the placenta is liable to more than one disorder, besides those that are more known among the common people.

And if this disorder extend itself to a considerable degree; there seems no room to doubt, but it may be a cause of abortion, and of the death of the foetus. This is generally the effect of scirrhus placenta, into which the disorders observ'd by me, would, perhaps, in course of time, have degenerated.

For those celebrated men, Jo. Sebast. Albrechtus (n), and Jo. Justus Fickius (o), have seen abortion from thence: both of them of monstrous foetus-

(m) N. 5.

(n) Act. n. c. tom. 4. obs. 104.

(o) Commerc. Litter. a. 1732. hebdom. 20.

ses, or far less than the beginning of ingravitation requir'd; as Fickius saw the substance of the placenta so scirrhus, that it could, by no means, be now capable of performing its function, and the funiculus umbilicalis corrupted, and in a manner dried; and Albrechtus saw small tumours lying at a distance from each other, thro' the placenta, internally of a whitish colour, very similar to scirrhus glands; and betwixt them, about the origin of the funiculus, an hydatid full of a yellowish humour.

At which place, the celebrated Roederer (*p*) also saw a bladder, wherein a humour of the same kind was contain'd; but a much larger bladder, the fundus of which was constituted by the very substance of the placenta itself, and was full of a pretty soft scirrhus.

But because abortion, as I said just now, is also accounted for from the corruption of the funiculus umbilicalis; we must not omit to take notice, that it may also be deduc'd, either from the too great thickness, or thinness, shortness, or length thereof.

An example of the first, and second cause, you will see taken notice of by Ruysch (*q*); who had even represented the first in a figure, as "not being unfrequent" (*r*).

And you perceive, that, as too great, or too little, a quantity of fluid being carried to the embryo, or being carried back from it, may be fatal thereto; so the vessels of the funiculus, being either more capacious, or more slender, than they ought to be, may make the rope either more thick, or more thin than is natural; nor is that which Ruysch alone (*s*), as far as I know, saw, and that once only, to be consider'd in any other view than that of being very rare, and wonderful; I mean that a child was born, healthy, in whose funiculus umbilicalis was a tumour form'd, "hard in its consistence, and of a substance partly fleshy, and partly heterogeneous, mix'd with a small quantity of fluid;" unless, perhaps, it was external in its situation, so that by pressing upon the vessels it could not make them more slender; or had not begun to take a sufficient increase, before the latter part of utero-gestation.

And when the funiculus is very short, being drawn down by the agitations of the fœtus, it makes an impetus upon the placenta; or at least does some injury thereto; observations of which kind are extant in this section of the Sepulchretum, that is in the thirty-seventh (*t*). To which you may add that propos'd by Littre (*u*), of a funiculus being so contorted, that it not only became more thin by one half than before, but also shorter by one half.

But one that is very long is liable to be convoluted in the form of a halter, or to be dispos'd into knots; so as to strangle the fœtus (*x*), or vehemently constrict its own vessels. For the celebrated Gutterman (*y*) found the vessels obstructed by the force of a double and close knot, which could not be drawn asunder, but with a very slow and cautious hand; making an excellent conjecture at the same time, that the first formation of the knot was indicated by the diminution of motion in the fœtus; and after this more and still more; and that when, at length, none at all of these motions are perceiv'd,

(*p*) Dissert. de Fœtu perf. §. 15.

(*q*) Advers. Anat. dec. 2. n. 10.

(*r*) Thef. 6. tab. 2. fig. 5. & tab. 3. fig. 2.

(*s*) Thef. 9. n. 3.

(*t*) Obs. 1. §. 7. & 9.

(*u*) Mem. de l'Acad. R. des Sc. a. 1701.

(*x*) Sepulchr. obs. 1. cit. §. 8.

(*y*) Commenc. Litter. a. 1731. specim. 20.

we may gather, from hence, that the closest constriction of the knot is brought on.

But that the same successive decrease of motion, which is finally follow'd by an abolition, may happen also in the injury of the placenta, when increas'd every day; as for instance, by reason of the shortness of the funiculus, or from a scirrhus, or any other disorder which increases therein more or less; is not only hinted by reason, but particularly confirm'd by observations, one of which you will find in the *Sepulchretum* (z): and others you may collect from the dissertation (a) of the celebrated Peter Stuart, who confesses that he had receiv'd the dogmas advanc'd by him, from the mouth of the very experienced Friedius (b).

26. Now I will speak slightly of some other disorders, from whence women, who miscarry, are in danger. Ruysch (c) knew that there were many physicians, who, being ignorant that in the first months of utero-gestation, the placentæ are of themselves very small; but finding that, by reason of a great quantity of blood for the most part adhering to them, closely, on every side, they seem larger, having seen these placentæ after being expell'd by miscarrying women, and expecting in vain a foetus corresponding to that placenta in size, whereas that which there had really been, had either escap'd without being perceiv'd, by reason of its diminutive size, or had been dissolv'd into nothing; or a kind of fluid; had given medicines to expel the foetus, to the great detriment of the mother.

He therefore thought that physicians ought to be admonish'd of this easy deception. And this admonition I think ought to be the more insist'd upon by us, because, besides that blood adhering to the placenta, and increasing it, I have hinted above, according to the opinion of Vaterus (d), that the placenta itself may actually increase to an unnatural size; when the little foetus is already dead, and for that reason more likely to escape notice, with great ease.

27. But there is another disorder much more dangerous. For, as the placenta of an immature foetus; or at least of one that would not have been excluded at that time, if no violence had taken place; is, for the most part, affix'd to the uterus closely, as sour and unripe apples are to their stalks; it sometimes happens that it is fix'd extremely close: and that with the danger which this observation of Valsalva sufficiently demonstrates.

28. A woman of three and thirty years of age, having, while pregnant, once and again lifted a certain heavy weight, from one place to the other; she brought forth a foetus of seven or eight months: but the secundines did not follow. The day after she was seiz'd with a fever and rigor: and this fever growing stronger and stronger, a few days after a difficulty of respiration was added.

In the mean while a foetid matter was discharg'd from the genitals, with some pieces of the secundines. Finally, convulsive motions, and hiccups, attack'd the patient: her belly became very tumid: and she died on the eleventh day after delivery.

(z) §. cit. 7.

(a) De Secundin. Salutif. & cæst. c. 2. §. 8.

(b) In Proem.

(c) Thef. Anat. 6. n. 81.

(d) N. 17.

Her belly being open'd, the intestines and stomach were found to be so full of flatus, that the stomach occupied four times as much space, as it generally does in a natural state.

Upon opening the uterus, a great portion of the placenta offer'd itself, to the view; part of which hung down through the os uteri: and a part was so closely affix'd to the uterus, that it could scarcely be separated even by the help of the knife, and this portion was condens'd into a hard and very foetid body; the natural structure of it being obscur'd. And that part of the uterus, to which it had adher'd, was occupied by a pretty deep inflammation; which was also extended through the remainder of that surface, but slightly.

29. Whether you refer this observation to the class of unsuccessful births; of which I am now to speak; or by reason of the violent cause by which the foetus was discharg'd, before the full time of its delivery, you refer it to the class of abortions; it is evident that a part of the placenta, being fix'd to the uterus, had caus'd the death of this woman.

And this part must have remain'd fix'd after the separation of the rest, either by reason of a disorder of the placenta, fixing very thick, very long, or very numerous, radicles into the uterus at that part; or, what comes to the same thing, by reason of the disorder of the uterus, which receiv'd those radicles in that place, into more close, more deep, or more frequent pores; or from some other disorder peculiar either to the uterus or placenta; or even common to both.

But, whatever this disorder might be, which some other cause; that was the consequence of those exertions in carrying a weight, and prov'd by the acceleration of delivery; seems to have increas'd; at least this observation, at it increases the number of those upon which they ground their reasonings, who contend that the placenta should never be left in the uterus; so it also gives a handle to the followers of Ruysch, as three observations that you have in this thirty-eighth section of the *Sepulchretum* do also (e); gives a handle I say to reply, that at least the extraction of the placenta is not to be hasten'd, when it is so firmly and closely annex'd to the uterus, that it can scarcely be separated with the knife, as was the case in this woman: for that Ruysch (f) meant this, when he admonish'd us that we ought not to be in a hurry to extract the placenta, if "it adhere so firmly to the uterus, as no body would suppose, but he who had experienc'd it;" that is to say, if "it be attach'd to the uterus, as if it had become one substance therewith:" nor indeed did he, and his followers, on the other hand, want observations of very considerable mischief, and even death, having follow'd the violence of a hasty extraction.

I confess, however, I do not take upon me so far as to settle these controversies, which are of some standing, and were agitated among our countrymen, before they were by much later authors; and carried on to some considerable length of time: many writings being publish'd on both sides (*); on one hand by Monilia, and on the other by Ramazzini.

(e) Obs. 10. §. 1. 2. 3.

(f) Advers. Anat. dec. 2. n. ultimo.

(*) De his vide epist. 8. n. 29.

I will only say, that there is great need here of experience, and prudence, according to the exigency of the case, to prevent us (which is very difficult) from violating either of the precepts of Celsus (*g*): "that it is better to try " a doubtful remedy than none at all: (*b*) yet we must take care not to let " this remedy fall under the reproach of having kill'd the patient, whom her " own severe fortune had subdued."

And indeed, the most grave and considerate men are afraid of violence; as, after well weighing the arguments on both sides, they agree that there is no better remedy, either in art or nature, than to wait prudently for some little time.

And this I have seen more than once, when the woman lately delivered has been carried from her chair to bed; the uterus gradually contracting as she lay quiet and unmolested, and throwing off the secundines at the same time.

You will read that Hoyerus (*i*) had seen the same thing from the mere removal of the woman from one place to another. And if you turn over what has been lately written, upon this controversy, by that very experienc'd physician Andreas Pafsa (*k*); you will not only see, that every thing is treated of with great erudition, and judgment, but in particular will commend his prudent counsels, and admonitions; and this among the rest (*l*); I mean that the woman be remov'd from the obstetrical chair; wherein she is now wearied and languid, and endeavours in vain to discharge the placenta; into bed; that in a recumbent posture, the heart and the uterus may be able to do in a little time, what they could not do in a sitting posture.

But physicians are frequently brought into these ever terrible dilemmas that I was speaking of, by the improper haste of the midwives; I mean of those who, as soon as ever slight pains have arisen, oblige the women to expel their fœtus by too hasty endeavours.

For, nature disposing all things gradually and slowly, for an easy delivery, makes the connections of the uterus with the placenta also, if time be given, more prone to separation; and even separates it in the same manner she had join'd it: but if time is not given; the quantity of blood that is added round about astringes it still more.

And with what impetus nature impels the blood, not only to this part at that time, but elsewhere, is sufficiently shown by the example of that woman (*m*), in whom the plexus choroides were ruptur'd, "from a very strong, and " untimely, exertion, during the pains of labour;" whereby so great a quantity of blood was extravasated, that, "the brain being compress'd into a " very narrow space," a fatal apoplexy was unavoidably brought on.

30. The same midwives, also, deserve great blame, when they are so much in a hurry, as, of themselves, to rupture the membranous secundines, which it is evident ought not to be done, unless some necessity obliges them; as, for instance, if they are of such a thickness or hardness, as to de-

(*g*) De Medicina l. 2. c. 10.

(*b*) Ibid. l. 5. c. 26. n. 1.

(*i*) Eph. n. c. cent. 1. obs. 51.

(*k*) Ragionamento aggiunto al Disc. int. al
flusso di sangue & cat. consider. 13.

(*l*) N. 185.

(*m*) Aët. n. c. tom. 1. obs. 241.

lay, for a considerable time, and not without danger, the birth which would otherwise have already naturally come on.

For frequently, by an untimely effusion of the waters, the birth, for many reasons, from an easy and natural one, becomes difficult.

What? when, of a difficult labour, they make a fatal one, and the birth impossible; as when the passages not being sufficiently dilated, either because it is the first time the woman has been in labour, and she is pretty far advanced in life, or because the circumference of the pelvis is pretty narrow, or some tumour is the cause of obstruction; or when the foetus not being properly turn'd for its own exit, they oblige the woman to exert herself, and strain excessively; or make no scruple to give such things as they have heard do strongly expel the foetus, by exciting the uterus to more vehement contractions; or at least by exciting the blood and spirits.

From whence nothing can more easily happen, than, as on one hand the foetus is strong, and robust; and on the other the mother exerts herself with all her power; as the foetus cannot be propell'd through the natural passage; that the uterus is at length ruptur'd, and affords it an opening by which it makes its way into the cavity of the belly; either with its head its feet or its whole body; and kills itself and its mother.

I wish this case of the uterus being ruptur'd was very rare: for it is not only not rare, but more frequent than many imagine. At least you have, in this one section of the *Sepulchretum* (*n*), nine instances thereof. To which there are many that might have been and may be added.

For I have now, in my hands, four or five dissertations, in which "the uterus ruptur'd in child-birth," is treated of. Each of these advances new examples; and not only that, but one of them, as for instance that which is publish'd by the celebrated *Behlingius* (*o*), points out other not very recent examples at the same time.

The frequency of these cases may be conceiv'd of, even from the writings of our *Veslingius* (*p*); and it is surprizing to me, that, as many learned men, certainly, have collected examples of the uterus being ruptur'd by the foetus; none of them should have mention'd him.

For *Veslingius* having written of one of these cases, which had occur'd to him in the year 1640, said afterwards, in the year 1647, the following words: "the uterus itself is ruptur'd, which happens more frequently than is commonly suppos'd; and has been found by me four times already, in the dissections of gravid women."

And the assertion of *Veslingius*, besides those three instances that were met with by *Santorini* (*q*), is not only sufficiently confirm'd by the testimony of one surgeon, who affirm'd to the Royal Academy of Sciences at Paris (*r*), that he had seen sixteen instances within thirty years; but is also still more confirm'd by that of the celebrated *Haller* (*s*), who saw the same case "three times, within fifteen months."

It is true that these are not all of them instances of the uterus being rup-

(*n*) *Obs.* 2. §. 4. & *obs.* 3. §. 1. 2. 3. 4. 9.

roc. 11. & *obs.* 7. §. 3. & *obs.* 12. §. 2.

(*o*) *Med. super casu rupt. in partu uteri*, §.

5. & 12.

(*p*) *Epist. Med.* 25. & 45.

(*q*) *Istoria d'un Feto & cæt.* n. 15.

(*r*) *Hist. a.* 1724. *obs. anat.* 4.

(*s*) *De Rupt. in part. Utero obs.* n. 1.

tur'd, so that the fœtus burst forth into the cavity of the belly; and could not be discharg'd by the mother, or extracted by the surgeon. Yet most of them are: and the others sufficiently show, how fatal either an incipient, or a perfect, rupture of the uterus must be.

As these misfortunes then are so frequent, it is not without reason, that some suspect this ought to be plac'd among the other causes of the unexpected death of a woman, when coming on soon after delivery; especially if death itself come on with those symptoms, which Celsus (*t*) has given as the signs of the heart being wounded: for those who die of a wound in the uterus, says he, "have the same symptoms as those who die of a wound in "the heart (*u*)."

And if they die without bringing forth the fœtus, and considerable and strong motions thereof have been previously perceiv'd, but upon those errors I have mention'd being committed by the midwife, both the efforts of the fœtus, and of the uterus, have been suppress'd; and soon after the symptoms, I have refer'd to, show themselves in the woman; there is much more room for the suspicion: although we are seldom at liberty to confirm it by dissection, where even the most certain marks of the infant being dead with the mother, do not offer themselves; as, for instance, the coldness of the arm, which most of them, who do not burst forth, with their whole body, into the cavity of the belly, after the rupture of the uterus, are wont to thrust out by the vagina; the coldness, I say, of the arm, an incipient kind of putrefaction, and other appearances of this kind; for the relations and friends, and particularly the husbands, being averse to the dissections of their wives, do not send for the dissecters, but undertakers; and deliver both mother and infant up to them; supposing them both to be dead already.

31. But as the cause of the uterus being ruptur'd, is frequently the oblique posture of the infant, when he endeavours to extricate himself from his confinement; and as this obliquity generally happens from the obliquity of the uterus itself; I cannot help wondering, with Reimannus (*x*), how it happen'd, that, as the ancient physicians were solicitous about distinguishing, and curing, this disorder of the uterus, it should have been neglected in the latter times by most physicians.

He must have been very little conversant with Hippocrates, who is ignorant that he has spoken of "uteri being turn'd towards the groins, or the "pubes," or, on the other hand, backwards "towards the sacrum (*y*)," or, "to the right, or left side," or "inclin'd to the hip (*z*)," or "having a "transverse and oblique situation (*a*)," and, in like manner, that "the orifices of these uteri" are made oblique at the same time (*b*); and, as we have hinted already on a former occasion, that it is expressly said, "if the "uteri become oblique, their orifices become oblique also (*c*);" to omit many other passages of the same author.

And not only in the age of Galen (*d*); but purposely to pass over many ages, and many physicians, who follow'd him; when Joannes Mathæus de

(*t*) De Medic. l. 5. c. 26. n. 8.

(*u*) Ibid. n. 13.

(*x*) Eph. n. c. cent. 9. obs. 79. in Schol.

(*y*) De Morb. Mulier. l. 2. n. 33.

(*z*) N. 35.

(*a*) N. 36.

(*b*) Ibid.

(*c*) De Nat. Muliebr. n. 34.

(*d*) De Loc. Aff. l. 6. c. 5.

Gradi (*e*), our Hercules Saxonia (*f*), Rodericus a Castro (*g*), and many others after them, flourish'd, midwives, and medical women, were order'd to inquire into the position of the os uteri, by the insertion of the finger; that from thence they might distinguish to which side the uterus was inclin'd.

But if you compare Sennertus (*b*) with these authors, you will readily understand to how little the whole affair was already reduc'd; and how slightly it began to be touch'd upon. And if you look into Riverius, you will find that the treating of this disorder was wholly omitted.

In our memory, this almost obsolete opinion was reviv'd by Deventer (*i*) in particular; and in such a manner as to show (which I do not remember to have been done by the ancients) of how much importance it is to distinguish the situation of the uterus in women in labour, from the situation of the os uteri; for that difficult births often happen from the obliquity of the uterus.

To this opinion I see that many eminent men have assented, and do assent: although some disagree as to the cause of that obliquity. Thus in two dissertations publish'd by two disciples of the celebrated Friedius; one in the year 1736, the other eight or nine years after; I remember that this cause is plac'd in one side of the matrix being made heavier, on account of the placenta being fix'd to it; which does not happen frequently; and the fœtus being annex'd to that; just as Gradius (*k*) formerly, among the causes productive of obliquity in the uterus, plac'd this, if "by reason of the quantity of matter" in one part of it, "or by reason of an acquir'd gravity, a dragging of the other part, towards this, was brought on."

And even the observation which is the last of all added to this section of the Sepulchretum, seems to be consonant to their opinion.

Yet the ancients suppos'd the chief cause to consist in the contraction of the ligaments of one side; or even in the relaxation thereof: so that the sound part was drawn to the contracted, or the relax'd part to the sound.

And this opinion I am at liberty to transfer, from the adventitious disorders of these ligaments, to those which may also exist from the original formation; and this in consequence of what I have seen in dissections. For, in the autumn of the year 1706, I found the ligaments of the left side shorter than those on the right, in a young virgin of Bologna; from whence the uterus inclin'd to the left side.

And nothing forbids us to suppose, that, if the uterus, from an original, or adventitious cause, be inclin'd to one side, in unimpregnated women, when they become pregnant it must hang to the same side; if nothing happens to prevent it. At least it must, of course, hang to the same side for the first months of pregnancy.

And as it has increas'd with that inclination; although afterwards it raises itself up above the ligaments; it is most probable it will continue to be inclin'd to the same side, whereto it was before inclin'd. You therefore have

(*e*) Pract. tr. 4. c. 22.

(*f*) Prælect. Pract. p. 3. c. 11.

(*g*) De Morb. Mulier. l. 2. c. 17.

(*b*) Med. Pract. l. 4. p. 1. f. 2. c. 15. in princip. & c. 16. in fine.

(*i*) Obf. Chir. novum lumen Exhib. Obstetric.

(*k*) C. 22. cit.

many causes to which you may ascribe the obliquity of the uterus, and foetus.

Nor would I have you suppose that to be very rare, which I laid down in the last place; although you see that, as yet, there are not wanting those who agree with de Graaf (*l*), when he asserts that the oblique uterus had been met with by him “sometimes, though but rarely.”

That this appearance has, at least, not happen’d rarely to me, you will understand from my observations; eight of which I have already written to you (*m*), besides that whereof I spoke just now, as taken from the young virgin: two or three I will give you at another time, as relating more to another subject: but I will here moreover add five; which I shall not readily find opportunity to introduce elsewhere.

32. A strumpet, who was lame, of a small stature, and aged forty years, was taken off within a few days, in this hospital, and in the beginning of March 1717, by an inflammation of the thorax. At this time I was wholly taken up in the anatomical examination of the parts of the belly; for which reason I inspected only this cavity.

The abdomen, before I began the dissection, shew’d many cicatrices from buboes. And when the cavity was open’d, the intestines were turgid with flatus; and, for that reason, appear’d remov’d from their more frequent situation.

That part of the small intestines which lay nearest to the thorax, had begun to be a partaker of this inflammation, as frequently happens: nor was the liver quite free from the same disorder. The kidneys were enlarg’d, and in the pelvis of them was a kind of purulent urine. But the coats of the bladder were thick; and their internal surface unequal; perhaps from the lues venerea having infested the urinary organs, as is often the case.

One of the tubes of the uterus was agglutinated to the neighbouring testicle; yet in such a manner, as to correspond with its free and unconnected orifice, to the part of that testis in which a large vesicle was included. The other part was not very found; so that for this reason, perhaps, that, otherwise very slender, ligament, by which it was connected to the uterus, had become thick.

The uterus, which was in other respects in a natural state, inclin’d to one side; but whether to the left, or to the right, I have not committed to paper.

33. Notwithstanding I have said that this woman was lame, and one of them was lame in whom I shall hereafter describe (*n*) an inclination of the uterus: although Galen (*o*) seems to hint that those women, in whom is this inclination, have sometimes “a pain that goes into the hip: and that the opposite leg is sometimes lame in walking:” and Sennertus (*p*) tells us of a certain woman from Philaltæus, who was suppos’d “to labour under a sciatica” for that reason; and Saxonia (*q*) consider’d limping as a mark to which side the uterus inclines; and adds, that not only the lame limb, but

(*l*) De Mulier. Organ. c. 8.

(*m*) Epist. 29. n. 12 & 20; Ep. 35. n. 12 & 16; Ep. 40. n. 24; Ep. 45. n. 16; Ep. 47. n. 18 & 36.

(*n*) Ep. 56. n. 26.

(*o*) C. 5. supra ad n. 31. cit.

(*p*) C. 16. ibid. cit.

(*q*) C. 11. ibid. cit.

the upper limb also, on the same side, is, from his own observation, affected with a tremor and stupor; yet they either mean a much greater inclination than I found; or a tumour and pain of the uterus, which Galen (*r*) probably refer'd to, is join'd to the inclination; so that by these means there might be a pressure and tension of the nerves which go to the leg, through the same side of the pelvis, and are connected with the nerves of the upper limb, by the intercostal. I at least, in the greatest part of those women in whom I have seen the uterus inclin'd to one side, have not even observ'd a lameness in any, and still less have observ'd the other symptoms that are mention'd.

And as to Hippocrates (*s*) having said, "if the leg be made lame from 'the uterus after delivery," that is, as he explains it himself, in another place (*t*), "from the uterus being inclin'd towards the hip;" Reimannus (*u*) will show you how you may understand this, where he produces two instances of lameness seen by him after delivery.

I would also have you read the conjecture of Schoenmezerus (*x*); who, having frequently heard lying-in women "complain of a violent pain in the 'region of the larger trochanter, and in like manner a sensible drawing of 'the same, towards the exterior, or posterior parts;" and having observ'd that a virgin, who labour'd under a cancerous excrescence of the vagina uteri, was troubled "with similar, and even greater, inconveniences;" conjectur'd that the muscle, which lies next to the uterus, on the internal surface of the pelvis; I mean the obturator internus; may in violent pains, and throes, of child-bearing, "be bruise'd, inflam'd, ulcerated, or in any other 'way injur'd;" and by this means occasion that pain, and drawing, in consequence of its being terminated "in the notch of the great trochanter."

And, as you consider these things in your mind, you will naturally conceive, that in the throes of a difficult birth, other muscles, also, that lie near to the distended uterus in the pelvis, and particularly the iliacus internus, and that which is call'd the psoas, may receive some injury; and that, as these muscles go to the other trochanter, and raise the thigh, they may cause not only a pain, like that obturator in lying-in women, but also a difficulty of raising the thigh; which according to the different degree of injury is greater or less, or shorter, or of longer, continuance: for sometimes it is even perpetual; as I have seen in a noble matron, who was my wife's mother; which lameness she said had been left after a difficult birth of that kind.

But whether this had taken its origin from the same cause, in any of those we dissected, I cannot now certainly remember. However, to return to the subject; I have also found the uterus inclin'd in some gibbous women: yet not so that the gibbosity was brought on by the inclination of the uterus, but on the contrary the inclination of the uterus by the distortion of the spine; as certainly happen'd in those two of whom I shall immediately speak.

34. A gibbous old woman was brought into the hospital, when her disease was so far advanc'd in its progress, that it was not in my power to learn

(*r*) C. cit.

(*s*) De Morb. Mulier. l. 1. n. 16.

(*t*) L. 2. n. 35.

(*u*) Schol. supra ad n. 31. cit.

(*x*) Commenc. Litter. a. 1736. hebd. 43. n. 2.

who she was; for no sooner was she brought in but she died. Wherefore I demonstrated but very few things, from her body, to the pupils; and indeed so much the fewer, as I was furnish'd with a very good male body at that time; from which I was teaching, in the theatre, about the latter end of January, in the year 1748.

In the thorax I inspected nothing else but the heart, which was in a natural state; although it was furnish'd with four coronary arteries, as I shall describe on a future occasion.

And in the belly, the kidneys had not a very sound surface; so that I was less surpriz'd to find the bladder, in which there was a great quantity of urine, having its cervix well distinguish'd with sanguiferous vessels.

The right testis was somewhat turgid, just as if it had been the testis of a young woman; but it was distended by an hydatid of a considerable size, that was included in its body. And finally, the spine was distorted to such a degree, that the uterus inclin'd to the right side; and the left iliac vein was twice as long as the right.

35. The kidneys, and genital parts, of another gibbous old woman, who had died in the hospital of a long-continued and very violent ulcer of the leg, were brought to me into the college; almost at the same time of year, but two years before.

The right kidney was of a natural form and magnitude. But the left, although it equall'd that in length, was so much less in width, that the appearance naturally occur'd to the eyes of every one immediately.

Whether this was owing to the spine being distorted towards the left side, at the upper vertebræ of the loins, I cannot determine, as I did not see the body myself. Below, however, it was certainly so inflected to the right side, that the uterus hung towards the same side: and this appear'd from the round ligament of the uterus on the right side, being much shorter than the left: for that I might be convinc'd of this shortness, those who had taken the parts out of the body, had left the small part of the abdomen, through which it came out from the belly, connected thereto.

36. Yet I have seen the uterus drawn to that side; by reason of one of the round ligaments being very short; in three other women, whose histories you have formerly receiv'd (y). And that I take notice of for this reason; because, after Riolanus (z); who mentions only the broad ligament, which alone was probably shorter than usual, in his observation of this kind; I see that others are not wanting, and among those Weitbrecht (a), who suppose it to happen always from one of the ligamenta lata.

However, as I think that it sometimes happens from the shortness of both ligaments, in one and the same side, or from the laxity of them in the other side; so I imagine that the same circumstance may, at other times, be owing to the ligamentum latum only being shorter, if its fellow round ligament be very lax; or to the round ligament only, if the broad ligament be very lax.

But to the laxity of both the broad ligaments I attribute the falling back-

(y) Epist. 29. n. 12 & 20; Epist. 35. n. 16.

(z) Anthropogr. l. 2. c. 35.

(a) Synæsemolog. sect. 6. §. 41.

wards, or forwards, of the uterus; as in the woman of whom I wrote to you in the forty-fourth letter (*b*); although in her the left must have been somewhat less lax, or less short, as the uterus was somewhat nearer to the left side than to the right. Now take the remaining observations.

37. A woman, of about five and thirty years of age, had, not long before, had a vomica ruptur'd in the lungs, when she gave suck. As long as she could expectorate she liv'd. But at length; her expectoration having stop'd for the space of two days; she died in the hospital, in the beginning of December in the year 1740.

As the body was not emaciated, and very proper for anatomical inquiries, most of the parts were dissected and examin'd; except the thorax, which I purposely omitted opening; but none with so much care as the belly.

In this cavity then, some appearances were observ'd, that do not relate to the present subject; but among others were the following. The stomach, which was very long, before it reach'd to the antrum pylori, contracted itself to the extent of some inches; and soon after expanded itself into that antrum.

The intestinum colon was also contracted, in its beginning, to such a degree as scarcely to exceed the thickness of a man's thumb. The small intestines seem'd to be inflam'd as it were, in some places, on the left side; unless this might happen to be so from round worms, one of which was in the stomach.

The spleen was of a fleshy colour internally; not black; and almost of its natural magnitude.

But the liver was large; extending itself into the left hypochondrium; and had its right lobe divided almost into two lesser lobes, on its concave surface, by a deep and not short fissure. I found the roots of the hepatic duct within the liver, which was, in other respects, found, much thicker than the thickness of those that lay on the outside of the liver, seem'd to require in proportion.

The surface of the kidneys was unequal in some places; yet they were found in their internal substance. In the cavity of the pelvis of the abdomen was a small quantity of water.

The uterus was very much inclin'd to the right side; so that the tube, and the testis, being forc'd into a narrow compass in that part, had a much more extensive situation in the other. Finally, the trunk of the vena cava being cut across at the diaphragm, some black and coagulated blood flow'd down.

38. An old woman had her right leg bitten by a dog; after which an intestinal flux had come on, and a slight fever.

After many days the former ceas'd; but the latter continued. She was then seiz'd with a vomiting, by which she threw up some worms. And at length her vomiting ceasing, she sank by degrees, and died, in the hospital, about the beginning of March 1741.

This patient never had her pulse strong; yet she had intermissions now and then: there was sometimes a cough also, but this was slight. And why I

added these two remarks, you will conceive naturally of yourself, when I tell you presently what I observ'd in the heart, and about the lungs. For I not only examin'd the internal parts of the belly, but of the thorax and head likewise; and other parts besides, of this very lean body, within a few days: and that very accurately.

When we were about to dissect the brain, we observ'd air-bubbles in the vessels of the pia mater: and under this membrane was water; as there was also in the ventricles, but not in great quantity, nor so as to make the choroid plexusses pale.

On opening the thorax, we found the lungs to be turgid with air; and about them were many bronchial glands, some of which were much enlarg'd, and contain'd a tartareous matter within them.

Both the ventricles of the heart were stuff'd up with polypous concretions, among which was a black blood; being themselves of a white colour inclining to yellow; and some of them thick, and not easily to be pull'd asunder.

The valvulæ mitrales were made up, at their lower part, of a compact and white substance internally; and particularly in that part which is nearest to the great artery.

None of the valves of this artery were quite free from beginning ossifications: and one of them, on the surface that was turn'd to the paries of the artery, was almost universally bony; and for that reason rough, and unequal, with particles which you would have said were real bones; being here and there protuberant like grains of sand, and some of them lying upon each other.

On the other surface, the corpuscle which was restor'd by me, being pull'd away at the upper part, had degenerated into a fleshy excrescence, somewhat larger than itself.

In the belly, which we open'd first of all, the stomach appear'd to be somewhat tumid with air; being large of itself, and coming down so low, that the intestine colon, which lies beneath it, was below the navel. And the whole of this intestine; as in the woman last spoken of (c); except at its beginning, which together with the cæcum was turgid with air, had so contracted itself, that it seem'd to be one of the small intestines. On the other hand, the duodenum was much larger than it generally is; and moreover pass'd downwards, over a very long tract of vertebræ, on the right side. The other small intestines were of a pale and livid colour.

The glands of the mesentery were not very small, but of a middle size; being sensible both to the sight, and touch, under a small quantity of fat.

The liver was large: and in it two furrows, as if made by a strong impression of the fingers, descended in a situation almost parallel to each other: and that from the upper part of the convex surface, to a considerable tract in the anterior direction.

The spleen was thicker than is natural; and on its gibbous surface somewhat rough, with a kind of whitish granules, and of a pallid colour internally.

Finally, the uterus was inclin'd to the left side, and had its whole internal surface rough; but not ulcerated, although cover'd over with black blood; the whole internal surface, I say, of the fundus, but not of the cervix; although the corona of the osculum uteri was somewhat thicken'd.

39. Nor am I wanting in other observations, besides those that I have promis'd, of the the uterus being inclin'd to one side; but from a tumour in the opposite side.

These, however, are sufficient, at present, which I have added to the eight already given you in former letters; first to show you that the obliquity of the uterus is not very rare; and in the second place, that by comparing them all, one with another, you may know whether this, as some seem to believe, happens more frequently on the right side, or not less frequently on the left.

I have not leisure here to examine the observations of others. But out of the two, however, which I remember to have read in the *Sepulchretum*; the one of Joannes Riolanus (*d*), the other of Franciscus Sylvius (*e*); the former describes it as being towards the right side, and the latter towards the left.

And finally, by comparing all our observations together, you will naturally collect this remark: that the women, in whom this disorder of the uterus was found by me, had not complain'd of those violent symptoms, which Ruyfch (*f*) suppos'd to be the effect of a lateral inclination of the uterus; I mean a pain of the hypogastrium, a very frequent effort of expulsion, a continual desire of making water, or at least not a very quick and easy discharge of the urine; notwithstanding in some of them this inclination was far from being inconsiderable, and the frequent interrogation of physicians was not wanting, in order to discover every complaint wherewith they were troubled.

And indeed the figure of Ruyfch's (*g*); in which the inclin'd uterus is represented; does not show that part of the vagina which is annex'd to it; and to which we know that the beginning of the urethra closely coheres; to be so inclin'd, as would be necessary in order to account for those disagreeable symptoms in discharging the urine, that Ruyfch has attributed thereto.

But of the obliquity of the uterus enough.

There is a rare observation of contorsion being added to obliquity, which may be read among the histories that are in the latter part of the excellent dissertation of Rudolphus Jacobus Camerarius (*b*). For the uterus was found "so inclin'd to the left side, that the anterior part of the fundus "seem'd to be distorted, towards that side, at the same time."

And this contorsion was, as is said soon after (*i*), "conspicuous; and by "contracting the orifice of the uterus, perhaps impeded the birth at the same "time;" particularly of the fœtus, which was not properly plac'd, was larger than the usual size, and in a mother who was small, and in like manner fat.

(*d*) Sect. hac 38. obs. 9. §. 8.

(*e*) Sect. 10. libri hujus 3. obs. 28.

(*f*) Cent. obs. Anat. Chir. 88.

(*g*) Ibid. fig. 69. *

(*b*) Specimen. Experimen. circa Generat.

Hist. 1.

(*i*) In Schol.

You see how many causes of unsuccessful birth, may sometimes come together, at one time. But there are still others; as when the cervix uteri is shut up by some excrescence: which was the case in the woman whose dissection we have in the history of the Royal Academy of Sciences at Paris (*k*): or when the os uteri is almost of a cartilaginous hardness, such as it was found to be in a woman not yet forty years of age, by the celebrated Helmstädt professor, Fabricius (*l*); nor did he think it was without reason that he reckon'd it among the other causes of a difficult and preternatural birth, as giving very great resistance to the dilatation necessary for delivery: or when the funiculus umbilicalis is much shorter than it generally is, and is an obstacle to the efforts of the foetus, in endeavouring to extricate itself; or if these efforts are very strong, is apt to produce an untimely separation of the placenta; and even is apt itself to be broken asunder.

Thus you will see, in how much danger both mother and foetus were, when a funiculus "scarcely six inches long," was seen by the celebrated Stegmannus (*m*).

But out of the other causes of difficult birth; since they are almost innumerable, and we have a great number of different causes still remaining; it will be proper to speak of one, which is a very common one among the principal of these causes.

40. This is the foetus when dead in the uterus: which first creates this difficulty; to make it very doubtful, whether it be really dead.

There were, formerly, some who acquiesc'd too easily, as melancholy examples have taught us, in certain signs of the death of the foetus; and if the meconium, for instance, flow'd down through the pudenda of the woman in labour, they did not hesitate to pronounce that the foetus was already dead. The fallacy of which sign, not only others, in other places, but I myself have very evidently found here, in the year 1730.

The wife of a tradesman, who was about nine and twenty years of age, having drunk water instead of wine, almost in general for the space of three years; and having come to the regular period of her fifth or sixth pregnancy with good omens; discharg'd so great a quantity of waters, at one and the same time, from her genitals, that every one was surpriz'd at it; but not she herself.

For she knew that she had drunk much more water in this pregnancy than usual; and that less had been discharg'd by the urinary passages for the last month than usual.

She was surpriz'd however, as the infants had always hitherto immediately follow'd the effusion of the waters, together with their secundines, and the births had been very happy; notwithstanding the children had all ceas'd to live within fifteen day; she was surpriz'd, I say, that her waters having been discharg'd on the preceding day in the morning, which was the eighteenth of February, another day had now come on, and nothing had been discharg'd besides a watery humour, which still continu'd to flow; when behold! on the same morning, the meconium began to flow together with that fluid.

(*k*) A. 1705. obs. anat. 7.

(*m*) Eph. n. c. dec. 3. a. 4. obs. 113.

(*l*) Progr. Acad. edit. a. 1750. m. Januar.

Wherefore, in the afternoon I was sent to, and desired to go and see her, and consult with her physician upon the case.

Upon hearing that this gentleman intended to do, and to give, such things, as he hop'd would bring back the pains, and efforts, of the uterus, that were gone off; I told him, that I thought the first inquiry to be made, was, whether the foetus was dispos'd in such a figure, as is requir'd in a natural state; from which, I fear'd, if it were living, it was far distant: and what made me fear this was the discharge of the meconium.

I inquir'd what was the report of the midwife. And was answer'd that she, as far as could be judg'd from the examination of the abdomen of the mother, suppos'd the foetus to be plac'd transversly. But that it was alive the mother did not doubt, as she thought she had heard it cry. But let us, said I, pass by this notion of the child's crying, which is an uncertain sign.

Yet why was not the former which confirm'd my opinion (for the anus of the infant being turn'd towards the vagina, and the parts adjacent to the anus being probably compress'd, the intestinal excrements might be forc'd out, even before the infant breath'd) ascertain'd to the midwife by the introduction of her fingers? The mother, say they, refuses to submit to it.

But what, said I, if it should be necessary to introduce the hand into the uterus, and extract the foetus; after having first turn'd it to a more proper position, if that should be necessary. And if her mind cannot be now influenc'd; you may take it for granted, that unless the midwife is deceiv'd, or the figure, which she has spoken of, is chang'd to a better, the infant will not be born, at last, without the assistance of a surgeon, which may perhaps be too late.

One or other of these suppositions must have taken place. But whichever was the case; they said that the position was afterwards chang'd, and that the pains of labour coming on, the infant was, at length, born in its natural figure; though not without great difficulty on account of its magnitude.

This however is certain, and what relates chiefly to the point in question; that the child was not born before the eighth hour of the following day, and was still alive: that is at least fifteen hours from the time in which, being in the uterus, it had begun to discharge its fæces: and it even liv'd a little while after the birth; so as to make it very evidently appear, that this discharge is a deceitful mark of the foetus being dead.

And I have given you this relation, because it is only by inculcating still other and other observations, from time to time, that these errors, and prejudices, can be rooted out from the minds of weak women and common people.

For it does not escape me, as I said above, how often the same thing has been before: and indeed; to omit other examples; one of the histories just now mention'd (*n*), when I took notice of the distortion of the uterus, will plainly show you, that a girl was born living, healthy, and brisk on the fifth day after the meconium was discharg'd.

Nor is it only that some compression; especially of the belly, which easily

happens when the body of the foetus is not folded into the most suitable posture; but that either the greater quantity of fæces, which are then almost fluid, or the acrimony of them, by irritating the intestines; may overcome the power and resistance of the circumjacent sphincter, which at that time are but small.

And must it not happen, that this power of the sphincter is sometimes almost nothing at all; and not only by reason of the great infirmity and weakness of the foetus, but by reason of a paralysis? And it concerns physicians; who are not willing to be deceiv'd, even by many other signs that are generally supposed to argue the death of the foetus; to remember with carefulness, that the strength, and retention, of the foetus, may be soon after restored; as after a syncope, by cheering and comforting the foetus together with the mother; or if not wholly restor'd, at least in great measure.

Suppose, by way of another example, that there is no pulsation in the umbilical rope, and even none in the arteries of the foetus. It is, without doubt, certain that the foetus is alive, if a pulse is really perceiv'd. I said really; for what Lancisi (e) relates to have happen'd in respect to a man of the first rank; that, in his wrist after death, I know not who contended there was a pulse, which in fact was no where except in his own fingers; I fear may much more easily happen to a surgeon, who, in order to inquire into this circumstance, has introduc'd his fingers, after being heated within the warm parts of the woman, and by the operation itself.

And I commend those, who, in order to avoid this fallacy, have admonish'd the surgeon, that he, at the same time, compare the number of pulses perceiv'd by him, with those of his own at the wrist; which she must take care to have observ'd by some other person; so that if the numbers exactly coincide, he may be sure he is deceiv'd: but if on the contrary, that he is not deceiv'd.

Yet although that which we have said is certain; it does not immediately follow, that the foetus is dead, if there is no pulse: for the strength of the foetus may then be very languid, but soon after return.

And neither the fatal deficiency of pulse, nor the coldness, nor lividness, of the funiculus, nor of a limb of the foetus hanging out of the uterus, give a sufficient proof of the child's being extinct: for they may be so constricted within the narrow passage of the contracted os uteri, that if a gangrene even begins to affect the limb, and the cuticle begins to be separated from it; though it is very evident that the life of the infant is in very great danger, yet that life is entirely extinguish'd, is by no means certain and evident.

And indeed at Breslau, although the arm of the infant was hanging out "in a livid and cold state," so that it was judg'd proper to amputate it, as if the foetus were without doubt dead; yet this foetus was born (p) "on the third day and living."

41. However, where either the very series of evident causes, and circumstances, or the greater part of the signs, and those such as are to be depended upon, or at least of the most importance; of which kind are the very easy separation of the cuticle from the head, a humour of a cadaverous smell dis-

(e) De subit. mort. l. 1. c. 16. n. 8.

(p) Eph. n. c. cent. 3. obs. 57. in fin.

tilling from the uterus, and other signs of the like kind; where these symptoms, I say, have induc'd the more skilful physicians, and surgeons, to suppose, with unanimous consent, that the infant is dead within the uterus; another difficulty naturally arises: that is, whether it is better immediately to extract it with the hands, or to make use of other remedies previously thereto.

I remember, that, when I applied to the study of physic at Bologna, it happen'd to two illustrious matrons, in one and the same year, that they could not bring forth their children; and as the fœtus of each of them was suppos'd to be dead, that in one it was taken away by the hands of the surgeon; but in the other, that, by patience, and waiting, and particularly by the use of a clyster, that was emollient and stimulant at the same time, the fœtus was discharg'd; the former mother dying soon after, but the latter being sav'd.

Although the gentleman who had been physician to both of them, a very learned man, gave his reasons, why, in the former case, he thought it necessary to hasten the event, and why in the latter there was room to wait; yet he did not get praise, from the recovery of the one, equal to the reproach he got by the loss of the other: reproach that was in my opinion unjust, but prevail'd even among physicians and surgeons of eminence.

And although it is not at all to be doubted, but it becomes physicians to act differently according to different circumstances; yet it is scarcely possible to avoid censure, unless you act in consequence of the unanimous opinion of the most celebrated physicians, in the use of every doubtful remedy: and especially if it happen, as in this case, that the assistance of a skilful and experienc'd surgeon is wanting.

Nor is it sufficient to save the patient, we must also see that no injury is done to the uterus.

I was consult'd some years ago, for a gentlewoman, who, after four very successful births, had had occasion, in the fifth, for the assistance of a surgeon; who having it in his power to extract the infant easily by the feet, (which he ought to have done) as it presented with them, push'd them back nevertheless; and while he was endeavouring to turn the head to the orifice of the uterus, and extract the fœtus by laying hold of it, he teaz'd the woman, who was, in other respects, of a delicate habit, so long and so violently, that not only an inflammatory fever, which brought her almost to death's door, was excited; but also, in the three following times of child-birth, the infants never presented themselves with the head, but always thrust out the hand: and it is very supposable that this was owing to an injury being done to a certain part of the uterus which prevented it from sustaining, or expelling, them equally, on all parts; and was thereby the cause of a preternatural position.

For which reason, if there is nothing that requires haste, and the position of the dead fœtus is not bad, the greater time is, in my opinion, to be given to the woman, and to nature; that the latter may excite the efforts, and pains, of child-bearing, and the former, by collecting her strength together, may contend, with all her might, to deliver herself of her burden: and it is sometimes

times of use, to assist the endeavours of the mother a little, by applying cautious and skilful hands to the belly.

But because nature is sometimes very slow in promoting those pains, or does not excite such as we would wish; but rather convulsive pains, which are diametrically opposite to our purpose; it will be our business to appease the latter in time, and to promote the former, if that is really in our power.

I remember I was call'd to a woman in labour, who; having been now troubled with this bad kind of pains, that I have spoken of, for the space of two days; could neither get any sleep, nor retain any aliment; but was oblig'd to throw every thing up by vomiting.

Having, therefore, given this woman half a grain of opium, before her strength was quite exhausted; she began at once to retain her aliment, and these convulsive pains were at the same time appeas'd: so that the true labour-pains coming on soon after, and the orifice of the uterus, which had been kept in a constricted state by the former, being open'd, the child was happily brought forth.

And in so doing, I rejoice not only that I follow'd the method of Deventer (q), which I then knew, but also the practise of that excellent physician Richard Mead (r), as I now see.

But in the other case of which I spoke, wherein nature is very slow in exciting proper pains, she is first to be assisted by clysters, contriv'd for that purpose, and unctions applied to the abdomen; as far as it is possible to do it thereby: then, if these are not sufficient to answer the purpose, by giving something of the same kind internally, which may invite rather than stimulate nature; avoiding every thing that can agitate and create danger.

You will perhaps laugh at me, if I tell you what I know, from the most authentic informations, to have happen'd in the country about Padua, some years ago.

A woman could not bring forth. A surgeon in the village where she liv'd, sent four ounces of the oil of leucoion luteum vulgare, wherewith to anoint the belly as usual. The rustic and ignorant women, who were about her, suppos'd it to be sent in order to be taken inwardly; and immediately gave it her to drink. And by this means she was deliver'd.

The surgeon, taught by this case, gave the same quantity of the same oleum cheyrinum; as they call it in the shops; to three or four other women; who were in a like difficulty; and with a similar success.

After this it was given to a woman at Padua in my knowledge, who could not bring forth her dead fœtus; and by this means the head of the infant descended somewhat lower: although, by reason of the great magnitude thereof; to which the lower circumference of the pelvis was not equal; it could not be deliver'd without the assistance of a surgeon.

That the flowers of the leucoion are given, by physicians, to promote the discharge of the menses, the fœtus, and the secundines, is extremely well known. But that the oil, in which these flowers have been macerated, had been given, I do not remember: nor is it to be wonder'd at; as so many things less unpleasant are suppos'd to answer the same purpose.

(q) I. supra ad n. 31. cit. c. 17. 26. 50.

(r) Monit. medic. c. 19. sect. 5.

However,

However, it will not be altogether useless, to have taken notice of this also, if any one should happen to suppose, either that the force of the leucoion, whatever it may be, is temper'd by the oil; or rather, that, when this force is in action, it is properly mitigated at the same time; if any thing requires mitigation, as I just now shew'd in the convulsive pains.

42. As to what I have said above (s); that we may wait, if no occasion presses; I would have you understand it in such a manner, as to suppose it allowable, if no signs of a putrescent foetus begin to appear; which signs come on the sooner, where the waters are discharg'd: for the air enters, thro' the ruptur'd membranes, to the dead body, and brings on such a corruption; which, although it even attacks those carcases of the foetusses, that are not expos'd to the contact of the air, yet attacks them, for the most part, much later, and without any acute fever of the mother: and this you will understand, from the histories which give you the relation of the bones of foetuses, conceiv'd long before, being discharg'd, either by abscesses of the abdomen, or by the anus; the mother for the most part being sav'd.

And these histories have grown out to such a number, from the time in which Albucasis produc'd his (t), that although they are collected by more than one author, there are some which we could wish had been added; and many are wanting which were not extant at that time.

One of these, in my opinion, is that which Dominicus de Marinis (u) publish'd, from his own observation, in the year 1667; the cranium of whose foetus, as well as the other bones; that had been excreted by the anus of the mother; were preserv'd by Guilielmus Riva.

And there are not a very few of these, which even Italy alone has offer'd in our memory. For; to omit the foetus, which was extracted from the rectum intestinum of a woman, by that industrious surgeon, at Venice, Nicolas Patuna, and sent to me by him, in order to be examin'd; concerning which both he himself (x) and Santorini have written (y); the same Santorini (z) has made mention of a woman; in the territories of Padua, and perhaps living at this time; who had discharg'd the bones of a foetus by the same way: and that celebrated man Francesco Serao inform'd me, by letters dated at Naples, about the end of the year 1739, that the bones of an infant had been discharg'd by another woman, not long before, from the same place.

And that at Brescia, and Vercelli, the bones of other foetusses have been, in this our age, taken out from abscesses of the abdomen, our Vallisneri (a), and the celebrated Fantonus (b), have asserted.

And, without doubt, there are other observations of this kind, among my countrymen in this age; the knowledge of which has not come to me: or if it has come, I do not at present remember them.

But as there is scarcely any thing in the medical art, which is not liable to exceptions; therefore I have suppos'd, that what I said just now, of putrefaction coming on very late, if the air does not enter; and very soon if the air does enter, and in a very dangerous manner; was for the most part,

(s) N. 41.

(t) Chirurg. l. 2. c. 76.

(u) Dissert. de re monstruosa per urinam excreta.

(x) Relaz. int. al cadav. d'un Feto & cæ.

(y) Inst. d'un Feto &c.

(z) Ib. n. 31.

(a) Istoria della generaz. p. 2. c. 17. n. 17.

(b) De obs. med. & anat. epist. 7.

but not always true ; being induc'd to be of this opinion by many observations, but particularly by two that were publish'd in one and the same year (c), by those celebrated men Reusnerus, and Nebelius.

For one of them speaks of a fœtus, of five months, being dead in the uterus ; the same being discharg'd after no more than twenty weeks, “ with “ a most filthy odour ;” notwithstanding, by reason of the secundines, and the waters, being retain'd at the same time, no access was given to the air.

And the other gives the relation of a mature fœtus, which was endeavouring to procure its own discharge at the proper time ; but, after the efflux of the waters, gave the more certain signs of its death, as, in the following weeks, “ a foetid and bloody ichor, with little pieces of membranes, and “ fleshy fibres, flow'd out from the pudenda :” and finally, this fœtus was reduc'd to a skeleton ; so that the crackling of the bones was heard, as often as ever the woman bent her body backwards, or forwards : yet she, being afflicted with no fever that is mention'd, nor any other considerable inconvenience, had even carried those bones in the uterus, “ for three years together, “ without any loss of health.”

And I could wish, that, as many dead fœtusses, besides those I have mention'd, have long made their sepulchres within the belly of the mother ; so, many living infants might not be buried together with the dead mother ; but were taken out in proper time from her carcase.

For while the surgeon is sought after to open the body, while he is call'd and coming, the fœtusses that were living, and especially the more weakly, frequently die ; the women, and even many men, equally rude, and full of ignorance with themselves, taking care to keep the mouth of the mother open : whereas, they should rather take pains, with some hope of utility, that the body of the mother, and particularly the belly, may be kept warm ; which not only reason itself sufficiently argues for, but is likewise confirm'd by the experiment of Stalpart the son (d), on the fœtusses of dogs.

For having put them into warm water, wrap'd up in their membranes, he found a pulse in them even after some hours.

And indeed, upon opening the belly, and uterus, of an illustrious matron of Silesia (e) ; who had been dead four hours before the surgeon came ; a living child was found : the persons who were about the deceas'd mother, not having omitted to foment her abdomen continually, till he came, “ with “ spirituous fomentations, with the balsamum embryonum, with generous “ aromatic wine, with warm flannels, and the like ;” without being in the least deter'd therefrom, as I suppose, because they perceiv'd no motion in the uterus.

For otherwise, the writer of the observation would scarcely have subjoin'd the following words, which are frequently true : “ for the fœtus is most generally alive ; notwithstanding there is no evident motion.”

43. But in regard to women in labour, I have spoken sufficiently. Let us now add a few things, also, in regard to women after delivery. And to this subject relates the observation which I made, on the twelfth of August, in

(c) Eph. n. c. cent. 5. obs. 11. & cent. 6. obs. 52.

(d) Exercit. de nutrit. fœtus §. 41. in fine.

(e) Eph. n. c. cent. 3. obs. 57.

the year 1707, together with my very learned Venetian friends; and in particular Santorini; and which I have spoken of, more than once, in the fourth of the *Adversaria* (*f*). Now take the whole of the observation.

44. A woman, who was subject to hysterical disorders, and had a bad colour in her face, being already the mother of some children, and again in a state of pregnancy; had an apprehension that the next birth would be fatal to her.

And, at the time of her labour, she actually began to swell in her fingers and abdomen: and soon after, having brought forth a girl instead of a boy, which she had hop'd for; and by reason of a kind of wager, she would much rather have prefer'd; and this circumstance of the sex, though cautiously conceal'd from her by the women who attended, being imprudently reveal'd to her by her husband; she was seiz'd with such an anxiety of mind, that her pulse immediately sank, and her body became cold.

It was then scarcely an hour, from the time the girl had been born; and except some part of the membranes, which the healthy and lively girl had drawn with her, nothing of the secundines had been discharg'd: either because the placenta adher'd very closely, or because the midwife had judg'd that she ought to wait for the assistance of nature; as she remember'd that her own grand-daughter had formerly discharg'd the retain'd placenta, on the tenth day after the delivery of the child.

As, therefore, neither pulse, nor heat return'd; within an hour and a half from the time that they began to be deficient, death succeeded: the flux of blood from the uterus; which you will be surpriz'd at in this defect of pulse; continuing in its usual state till the very last extremity of life.

We open'd the body at the twenty-fourth hour after death. From the mouth, and nostrils, of the carcase, a great quantity of ill-smelling water was discharg'd. The tumour of the belly was so great, that I do not remember to have seen a larger, even in patients with an ascites.

And this tumour did not subside very much, when the peritonæum was open'd; for it was then found to be chiefly owing to the stomach, and intestines, being distended with air, in a surprizing manner; and to the uterus that lay beneath them, which not only occupied the whole pelvis by its roundness of bulk, but even exceeded that dimension.

Before we cut into the uterus, together with all the appendages connected to it, we observ'd a bloody water to be effus'd into the cavity of the abdominal pelvis. And we had before observ'd the vessels, which are under the skin of the thighs, near to the pudendum, to be fill'd with blood: and the bones of the pubes, where they are join'd to each other; having been examin'd, before dissection, with the finger, and having seem'd to gape, or at least to be very laxly join'd together; had their commissure scarcely touch'd with the knife, before they were separated from each other; some fluid being, at the same time, discharg'd.

And nearly the same things appear'd to us soon after, when we examin'd the juncture of the ilium with the sacrum; so that we believ'd those not to have been far wide of the truth, who have asserted, that, not only in women

in their first time of child-bearing, as Hippocrates has taught us (*), but sometimes, also, in a birth which is not very laborious, “the coxendices are “separated.”

Lifting up the uterus, after taking it out, we saw that a very large mass of concremented blood was discharg'd through the orifice of the vagina. Scarcely any thing of the nymphæ appear'd; probably in consequence of their having given way, and been extenuated, in the birth, in order to prevent the neighbouring skin from being lacerated; so that they would soon after appear in their former shape.

Thus our Fabricius ab Aquapendente (g); before he cut into the membrane which shut up the orifice of the vagina in a virgin, and was distended with a very great quantity of blood, which lay upon it; remark'd that there was no appearance of the nymphæ: yet these he presently saw form'd, when the membrane was incis'd, and the tension taken off.

From hence; if things are always in the same state after delivery, as Dionis (h) hints; you may conjecture at one of the uses of the nymphæ.

While we were looking at the external parts, I shew'd to my friends, the lacunæ which I had spoken of in the first of the *Adversaria* (i) in the former year; pressing out, at the same time, a whitish humour, and a considerable quantity of it, wherewith, in this woman, they abounded.

Soon after I also observ'd, and demonstrated, the lymphæducts of the uterus; as I likewise did the structure of the corpus luteum, in one of the testes.

But of these, and, in regard to the round ligaments of the uterus, how great a thickness they had, on account of the vessels, whereof they are in great part made up, being distended with blood; and, in regard to the uterus itself, of what fibres and sinusses it consisted, and how large these were, together with the external blood-vessels; and also, of the largeness of the osculum uteri, and of the dilatation of the cervix uteri, not being less than that of the fundus itself; and finally, of the very frequent orifices in that osculum, and the mucous glands in the lower part of the cervix; of all these, I say, I have already written what is sufficient, in the fourth of the *Adversaria* (k).

Now, if there be any thing which had no place there, it must be added, that you may have the whole of the observation as I promis'd.

Both of the testes had a kind of small foramen on the surface, through which a slender probe was admitted into the internal parts. And in that same testis, wherein was the corpus luteum, was a roundish bony cell; and in the cavity of it a bloody humour. The tubes were longer than they generally are.

The parietes of the vagina were extenuated, and itself was become much wider than its natural dimensions allow; but not at all shorter: some rugæ only corresponding with the corpus glandosum urethræ.

The osculum uteri was of a red colour, degenerating into black; and

(*) De Nat. Pueri n. 43.

(g) De Chir. Operat. ubi de Hymene Im-
perfor.

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(h) L'Anat. de l'Homme Demonstr. 4. sect. 2.

(i) Tab. 3.

(k) Animadv. supra ad n. 43. indicatis.

in some places lacerated. Within the cervix were no little chords prominent, nor small membranes.

It was evident that the placenta had adher'd to the upper part of the fundus uteri, in such a manner, as to cover the orifices of both tubes. And the same adher'd in some measure even then. But where it had adher'd, there the orifices of the uterus were extremely contracted; where it did not adhere, there they were large; as was with great truth said in those *Adversaria*, as the other circumstances were: which I here confirm for this reason, left, to those who have not yet happen'd to light on any such things, they may seem to be *paradoxes* in a different sense from that in which the Greeks had been us'd to understand this word. In the sinusses, with which those orifices communicated, was no blood.

Finally, in the thorax; for we never touch'd the head; both lobes of the lungs were universally of a white colour degenerating into livid, if you except the posterior parts where the blood had subsided in the supine posture of body. The heart was flaccid beyond description, and contain'd scarcely any blood in the auricles and the right ventricle; and in the left ventricle none at all.

45. That a great quantity of blood had flow'd out from the uterus, by reason of the placenta being loosen'd in part, I would not deny; but whether it was discharg'd in so great a quantity as to kill the woman, may perhaps with reason be doubted.

For, on inquiry from the women who were about her, we could not learn that a very great quantity had been discharg'd; and some of the vessels were distended with blood even after death, as I have told you above: so far were they from being "almost void of blood," as the celebrated Tabarranus (*l*) found them, in women who died of floodings, a few hours after delivery: then the pulse and the heat did not decrease gradually before, but suddenly, and altogether, at that very instant of time, when this disagreeable circumstance was related to her; for nothing of this kind is proper to be told to women in these circumstances, and least of all to those, who, being subject to hysteric affections, have their nerves prone to convulsions; which, if they seize upon the noble viscera, easily destroy the weaker and more delicate kind of women: and this you will find to have happen'd to a woman, who, being fatigued by preceding labours, and wearied by a difficult birth, was, soon after this, and at the very time she was speaking, contrary to all expectation, suddenly seiz'd with a convulsion and death; whereas the celebrated Jo. Sebast. Albrechtus (*m*) could suspect no other cause for this change, but disagreeable news, which was heard by the patient at that time.

Nor did it seem to all those learned physicians; who not only heard, with me, the relation I have given you, but were also present at the dissection; that the death of this woman had been owing to any other cause.

But before you judge, I would have you attend to this circumstance also; I mean into how great a tumour, and that a flatulent one, the belly of the woman had increas'd.

(*l*) Obs. Anat. n. 36.

(*m*) Act. n. c. tom. 4. obs. 50.

And you have, even in this section of the Sepulchretum; that is in the thirty-eighth; some observations wherewith you may compare this of mine.

In the first place the fifth, which, through carelessness, is repeated under number thirteen, of a woman, who, having died ten hours after delivery, had her whole belly tumid with flatus, is somewhat similar. But as it is said that her uterus was full of coagula, and many evacuations are mention'd; just as it is said, by Eustachius (*n*), that in the Roman matron, in whom the proper membrane of the kidneys was so distended with included flatus as at first to have the appearance of a large tumour, a great quantity of blood was discharg'd after delivery; at least turn to the fourth, and ninth, of those observations, that are added in the appendix.

Neither of these mention a hæmorrhage; but both of them describe the belly as having been distended within a very little time after death, with flatus, above what can easily be imagin'd.

Yet if you say that these women died in labour, and not after they had brought forth; and that the first of them had already carried a putrid fœtus in utero; see, I beseech you, how Hoffmann (*o*); notwithstanding he considers too great effusions of blood, among the preceding causes of inflations of the abdomen, and that even in the time of child-bearing; nevertheless soon after makes women subject to the same inflations from a contrary cause: as, for instance, if the flux of the lochia has not succeeded in a proper manner, or has been altogether restrain'd. Which I only hint, that you may remember, how many causes, and how different from each other, there may be of this same kind of tumour in the belly.

And whichever of these causes it was produc'd by in our woman, you will find, if you read the history over again, that it was form'd before the effusion of blood came on; for the woman had begun to swell in her abdomen, and her fingers, before she was deliver'd.

And in the case of that woman, of whom Phil. Jac. Hartmann (*p*) has written, the intestines were tumid with flatus, on the last days before delivery; and this tumour increas'd so much after birth; notwithstanding there was no profluvium of blood, and even the lochia were obstructed; that the superior and inferior tracts of the intestine colon, in particular, could scarcely be comprehended "in a thread that was three parts of an ell long:" the lower part of it therefore, being seiz'd with a sphacelus, and ruptur'd, fill'd the belly with the most fœtidordes, and carried off the woman on the second day after delivery: and to the uterus of this woman, "the remains of the "placenta adher'd internally, to the whole surface; and were easily separable with the finger: but in the cervix itself "coagulated blood adher'd."

However, not to speak only of those preternatural appearances, which occur'd in the body we have been speaking of; but even to touch, at the same time, upon others a little, which, that you might have the whole of the history, are not omitted here; I could wish that learned men had read, not in the patch-work of a mere compiler, who wanted many books that were necessary for his purpose, but in Antonius Sidobre (*q*), all those things which Chyrac had communicated to him, in regard to the lacteal ducts of the uterus;

(*n*) Tract. de Renib. c. 45.

(*p*) Eph. n. c. dec. 3. a. 9 & 10. obs. 102.

(*o*) Medic. Rat. tom. 4. p. 4. c. 15. Thef. Patholog. §. 8 & 15.

(*q*) Tract. de Variol. c. 7.

for they certainly would not have suppos'd that these were the "same," as those lymphæducts that I saw in this woman.

I could wish likewise, that those who have said these were seen by Ruysch, and others, had expressly pointed out the passage of that author, and the year in which others saw them; as I did not scruple to declare (*r*) at what time I had seen them, and to whom I shew'd them.

Who have seen them after me, I know; amongst whom I would have you observe, that the learned Stehelinus (*s*) had also seen them in a distended uterus: that is in the uterus "of a gravid woman."

But who have given figures of them, as appendages to the uterus of women, from the human subject, and not from the anatomy of brutes; I do not as yet certainly know: so that I am not surpriz'd, if, to that illustrious man Heister (*t*), these vessels, I say these vessels "as they are hitherto added" to the human uterus in figures, should seem to be taken from fancy."

But in regard to the bones of the pubes, and the ileum; I do not suppose you are in the number of those who contend, that it very rarely happens in child-bearing, for the commissures, or junctures, of these bones, to be found so lax as they were seen by us in this case; and that, when this does happen, it is to be imputed rather to the ricketts, the lues venerea, or to a cachexy: and this last, in a very considerable degree.

The woman, however, of whom we are speaking, although she had not a good colour in her face; yet certainly was neither affected with a cachexy, particularly in any great degree, nor with any of those other disorders: nor had a matron to whom I was related, labour'd, in the least, under any of these complaints; although, as she complain'd of a pain at the juncture of the bones of the pubes, after her time of delivery, and her husband would, for that reason, have me examine this part with my hand, she had one of the bones manifestly distant from the other at that time; but at other times had not.

And notwithstanding almost innumerable observations of this kind are extant, which many have collected; they have nevertheless omitted some, if I rightly remember, and particularly one of Veslingius (*u*): since he, in a woman in labour, "perceiv'd that the pelvis yielded, and shook, with a slight impulse; the bones, both under the pubes, and at the sides of the os sacrum, being separated from each other by the space of an inch at least:" and Santorini (*x*) found it easy also, to lay his thumb betwixt the bones of the pubes, in some women who had been lately deliver'd: since therefore so many observations are extant; is it more proper to suppose, that, in all of them, those disorders were to be accus'd, especially as the writers of the observations make no mention of them? Or must we suppose, that, as a greater or less separation, is not only not very rare, but frequent, it is not preternatural? And even, that, in those where it does happen, it happens from nature itself; for it comes on by degrees, is by degrees remov'd, and is of assistance to the birth, as far as it is possible for it to contribute thereto.

(*r*) Advers. Anat. IV. Animad. 43. in fine.

(*s*) Tentam. Med. p. 1. Thef. 6.

(*t*) Comp. Ana i n. 236.

(*u*) Epist. 25.

(*x*) Obs. Anat. c. 11. §. 4.

For do not imagine, that whatever enlarges the diameters of the pelvis, is useless in the promotion of delivery; and as to what is said of the dimensions of the pelvis; as if they were sufficient to admit of the passage of the fœtus, without any separation of the bones; it seems to have been taken from the skeleton, when no mention is made of such a number of parts, that are interpos'd betwixt the naked bones and the head of the infant, that is passing through them; and indeed, nothing of the uterus; the orifice of which is then push'd down to the orifice of the vagina: which parts, though they may not sufficiently diminish those dimensions in many; yet in many, on the other hand, may diminish them very much.

And that these junctures are gradually dispos'd to laxity; as I have hinted in the *Adversaria* (y), in conjunction with Pinæus; I have not only had occasion of knowing by examining the juncture of the ossa pubis with my finger, but during the revival of this letter, have seen confirm'd by dissection, by the celebrated Exup. Josephus Bertinius (z); and by the example of two women, the one pregnant with a fœtus of five months, and the other with a fœtus of seven months: for the cartilage betwixt the ossa pubis was not only found to be "thicker than usual, and impregnated with an unctuous humour" in both of them, but particularly in the second; in whom even "without a knife," and only by a slight assistance of the hand, one of the ossa ilii "was pull'd asunder," perfectly, from the os sacrum.

And if authors of weight and eminence had attended to this state, in the junctures of the bones of the pelvis; which is begun in gravid women, increas'd at the time of child-birth, and consequently often observ'd in women after delivery; they would not, in my opinion, easily have objected to those who suppose such a separation, "that they cannot be broken asunder by the butchers but with difficulty:" or that two strong men, pulling one on each side, were not "able to draw asunder" the bones of the pubes.

Nor indeed is that to be wonder'd at; for they were not previously dispos'd, as in women after child-birth. And indeed I commend the ingenuity of those, who, in dependance on a great number of arguments, have oppos'd the opinion of these separations as "impossible."

But it is to very little purpose, to endeavour to prove that to be impossible, by reasonings, which has been so many times seen: for it is easy to any one to set aside such reasonings; as it is more than sufficient immediately to refute them by the undoubted testimonies, of all those who have seen the circumstance, and demonstrated it to those who were present.

46. But women after delivery are not only carried off by disorders that are quick in their progress; as that of which I spoke last, or that which we read of in Henricus Sandenius (a), from the thickness of the uterus being increas'd to half a span, or rather from that which is not a very rare, but even a frequent cause; I mean a sphacelus of the uterus, which you will see describ'd in one, and another woman, by the celebrated Joseph Henry Fuchsius (b); I say, women after delivery are not only carried off by disorders that are quick in their progress, but by slow disorders likewise: for they are

(y) III. Animad. 15.

(z) Quæst. de hoc argum. proposita præside

(a) Observ. de Prolaps. Uter. §. 14. in fine.

(b) Act. n. c. tom. 2. obs. 146.

Bouvar. n. 5.

sometimes in an ill state of health a long time after delivery, and even as long as they live.

In what manner a slow fever, from an abscess of the testis and tube, carried off a woman after delivery, I have already said in a former letter (*c*); and I have shewn, at the same time, how it sometimes happens, that from a laborious utero gestation, and a difficult time of child-bearing, these parts contract great injury.

And that at the same time of pregnancy, the omentum, being compress'd by the uterus, and the other viscera; and for that reason sometimes inflam'd; may be form'd into an oblong and almost scirrhus tumour, which remains in some after delivery; as has even been observ'd by me; and affects them sometimes with pain, but always with some inconvenience or other; Ruysch (*d*) has taught us, and before him Bauhin (*e*) hinted, when he asserted, "that the omentum remains collected about the middle of the belly, after delivery, in some women; so as to excite considerable pains; which however, as I have already said, are not perpetual symptoms.

And these pains were the most severe, and obstinate, after delivery, in that woman, who having been afflicted with them a long time, and at length carried off thereby (*f*), had the omentum contracted into the form of a rope.

But it had grown to the bladder, and fundus uteri, in such a manner, that with the pains were join'd those symptoms, which made her appear to some to be hysterical; and to others to be troubled with calculi.

Add to this other disorders that are not painful, but very troublesome; which remain after a rather unhappy time of child-bearing; lameness, prolapsus uteri, and incontinence of urine, which have been spoken of in former letters; and have been partly spoken of in this (*g*).

Finally; for it is not my intention to enumerate every thing that relates to this question; "the hæmorrhoids in the orifice of the matrix;" that is at the orifice of the vagina; mention'd by Celsus formerly (*b*), and by the author of the book which they formerly attributed to Galen; that is the book *de Gynecis*; Arantius has, with great reason and justice, asserted, "generally, to have their origin from a difficult birth," in that chapter (*i*) which he has written upon the ill effects of those hæmorrhoids, their causes, signs, and cure.

And Paul Barbette (*k*) has added, by what marks the blood flowing from them, may be known from menstuous blood.

47. Last of all, the cause of unsuccessful births is not to be consider'd as existing in the mother only, but also in the fœtus that is brought forth; whether this is born dead, which circumstance I have spoken of before, or moreover whether it be born in a monstrous state besides being dead; or, finally, whether it be living indeed, but is born in a monstrous state, or affected with some other considerable disorder.

(*c*) Epist. 46. n. 27 & 28.

(*d*) Cent. obs. Anat. Chir. 63.

(*e*) Theatr. Anat. l. 1. c. 12.

(*f*) Eph. n. c. dec. 3. a. 4. obs. 7.

(*g*) N. 33.

(*b*) De Medic. l. 6. c. 18. n. 9.

(*i*) 56. in l. de Tumor. p. n.

(*k*) Anat. Pract. l. 4. ad fin.

First then, in regard to monsters, whether born alive or dead ; but what I shall say here, will be rather what relates to the observations themselves, than to the controversy which is agitated in this age, among very learned men, in regard to the origin of these monsters : and I shall begin with this observation of Valsalva.

48. The mother of a monster, which, as appear'd to the common people, was like a toad, had often brought forth children before, both of the male and female species promiscuously ; the former being all of them found in every respect, but the latter, which were two, one of whom was then in her thirteenth year, and the other some years younger, both deaf, and consequently dumb.

At last, having conceiv'd about eight months before ; and having lain, during the whole time of this pregnancy, always sad and melancholy, and accusom'd herself to weep often by reason of this state of mind ; and when she compar'd the motion of this fœtus with that of the others, which she had brought forth before, finding it so languid that she sometimes almost believ'd it dead ; she brought forth, at the time I have mention'd, a female fœtus, which was furnish'd with secundines indeed, that were in a natural state, but was so monstrous in its aspect, that it seem'd rather like a toad, than a girl ; if you except the lower limbs, and the inferior part of the belly.

In the first place, it was small, so as not to equal a span in length ; but was so much shorter than this, as to be deficient, in that extent, by the breadth of a man's thumb.

In the second place, the neck was entirely wanting ; so that the chin was contiguous to the middle of the breast, and even was scarcely distant by the extent of an inch, from the cartilago ensiformis.

The eyes indeed were perfect ; but the external ears were plac'd much lower than they generally are, and touch'd the upper parts of the shoulders : the mouth was gaping : the nose was imperfect at the upper part ; for the root of it, and the forehead, were entirely deficient.

Add to these horrid appearances, that the abdomen protuberated in the manner of a kind of purse hanging downwards ; into the middle of which purse the funiculus umbilicalis was inserted, and was in its natural state.

Finally, the upper limbs were so connected to the sternum, that they could not be extended. And on the posterior surface of the body, the spine appear'd to be distinguish'd into three gibbosities as it were ; the upper of which corresponded to the head, the middle to the thorax, and the lower to the belly.

These were the appearances externally.

And by the dissection of the belly, it was found that the purse, into which the abdomen protuberated, was owing not only to the relaxation of the integuments of the belly, but also to the muscles thereof ; and that in this relax'd cavity, as in a kind of sac, the liver, the spleen, the stomach, and all the intestines were contain'd : yet these viscera, as well as those that were contain'd in the thorax, were, in other respects, in a natural state.

When we came to the head, a confus'd heap offer'd itself to our view. For there were neither the bones that are wont to form the roof of the cranium, nor indeed could we find any cavity of the cranium ; but there were only

only bones of an irregular figure, some small, and some a little larger, connected to each other by an intricate net-work of muscles.

Not the least traces of the brain were found, except that certain bodies appear'd, which had a very fine resemblance to the nates and testes of the cerebrum; but only in their figure; for externally they were every where made firm with membranous connexions, and internally were not, by any means, similar to the substance of the cerebrum; but rather to a certain body of a middle nature betwixt glandular and spongy.

And even if the brain had not been deficient, and this girl could have liv'd; yet she must have been deaf as well as her sisters: because both the foramina, through which the nerves are sent from the brain to the ears; were shut up with a very firm membrane; so that no passage was left even for the most slender nervous filament.

Nor indeed could we find the medulla spinalis any more than the brain, nor any beginning from whence the nerves took their origin; notwithstanding they were carried through the belly, the thorax, and the limbs, naturally enough in other respects.

For in tracing even the largest nerves; as, for instance, the crural; when you came near to the spine, you saw that they gradually became more slender, and were fix'd into the spine indeed; but in the whole course of this spine there was not only no medulla spinalis, but even no cavity for the medulla spinalis to be comprehended in.

49. Although Valsalva has omitted to say whether this foetus was born dead or alive; and likewise, in what state the kidneys, the bladder, the uterus, and the nerves that run through the head were; yet he has written what is sufficient to make us very clearly understand, that the principal disorder of the same foetus, relates to the class of those which I treated of in my twelfth letter to you (*l*); when I affirm'd that the cranium was frequently in great part, and the brain wholly, consum'd by a hydrocephalus, in foetusses of this kind (which are indeed not uncommonly consider'd as toads (*m*);) and gave you examples of those (*n*), in which not only the medulla spinalis could not be found, but what is much more rare, the tube, wherein it is naturally contain'd, was entirely deficient.

And I did not relate this history of Valsalva's among the others in that letter, as, besides those particulars, it contains others; whether you consider the chin, or the spine, or the upper limbs, or in fine the abdomen, and the greater part of the viscera of this cavity; on account of which I thought it rather more proper to put it off till the present occasion.

To which I should certainly have defer'd, for similar reasons, if I had then had them, the observation of Baronius, which will be subjoin'd a little below (*o*), and perhaps another of mine, which is the third of the girls I dissected wherein the brain is deficient; for all of them, as well as this of Valsalva, and that of Baroni, were of foetusses of the female sex: which you will add to what I observ'd, in a transitory manner, in that letter (*p*).

(*l*) N. 5. & seq.

(*m*) Vide Haller de Foetu Hum. sine cerebro
not. 2.

(*n*) Epist. 12. n. 8.

(*o*) N. 52.

(*p*) N. 6.

But now take this third observation of mine: a similar one to which, especially on account of the spine being bifid at the same time, was made two years after at Copenhagen (*q*).

50. A monster; for so it was call'd; which had been born two or three days before in this place, was shewn to me by a surgeon in the month of February, of the year 1746.

Upon seeing it, I immediately said that it was without any brain. To confirm therefore what I said by dissection, I desir'd it might be brought to my house; where he inform'd me, that the woman, having been the happy mother of many children before, had likewise had a very happy time of pregnancy with this last.

But that when she thought herself come to the end, or near to the end, of her pregnancy; she had not got rid of this dead girl, but by a very difficult birth, that was quite unexpected; the foetus being at length taken away, by the midwife, by the feet.

Yet in effect, I found it to be considerably less than a full grown foetus should be: for it was not equal to the length of a foetus of seven months; and Valsalva, as I have already said (*r*), found his likewise to be very small: and this, if we conceive the head to have been previously distended, and enlarged, by the included water, may be understood pretty easily; as I have written to you on a former occasion (*s*).

However, this little body would have been fair, beautiful, and well fed, having no ill smell, and the cuticle having not yet absceded; as it was very well form'd in the rest of its parts; if these deformities had not been added, that there appear'd to be no neck: and above the eyes there was scarce any forehead. And from that place, instead of the common integuments of the body, was one reddish membrane: and this going over the upper part of the head; which was not at all protuberant in that part, and even had a declivity on the posterior parts; pass'd through the middle of the back to almost the lower part of the thorax; being the less broad in proportion as it descended the more.

Under this posterior part of the membrane, rose up two bony protuberances, as they seem'd to be; one of which proceeding from each side of the head, and being less elevated in proportion as they receded therefrom, and more near to each other, shew'd that a bifid spine was beneath the integuments.

At the sides of this membrane the common integuments were not deficient: and with these the lower part of the head, as well as all the rest of the body, was cover'd on both sides; being not only furnish'd with external ears, in that part, which were contiguous to the shoulders, but also with hair; as if that part of the cutis, which lay nearest, being pull'd away from the upper part and lacerated, that part of the hairy scalp which remain'd, had contracted itself downwards to this place.

These were the appearances externally.

(*q*) Vid. Rob. Steph. Henrici Descript. Omenti not. ad §. 11.

(*r*) N. 48.

(*s*) Epist. 12. n. 7.

And upon cutting into the abdomen, a great quantity of fat first came into sight; a great quantity of which was every where under the skin, likewise, wherever there was a skin: and when the remaining parietes of the belly were open'd, all the viscera appear'd to be in a natural state, as those of the thorax did also.

At length coming to the head, under that red membrane (which was thin) when cut through, there appear'd nothing which I could possibly consider as the remains of the cerebrum, cerebellum, or medulla oblongata, except two little horns as it were, which being thick, soft, and of a red colour, but degenerating into brown, were prominent in the anterior sides of the cranium, one in each; for when cut into, they show'd, besides concremented blood, a kind of mucous matter.

Under these horn-like prominences, was that part of the os frontis, which makes the posterior roof of the orbit. For the anterior roof was wanting; the bones of the sinciput were wanting; and all the part of the occipitis, that is not before the foramen magnum of this bone, which for that reason was none at all in this case, was wanting.

Bones of the temples there in fact were; but these were extended downwards, laterally, and backwards. And at the foramina of these bones, which the auditory nerves enter, I in vain sought for the beginnings of these nerves; as I did likewise for the others in this basis of the cranium.

And this made me be the less surpriz'd, when I examin'd the eyes soon after; which as well as the eye-brows were well form'd; to find the optic nerves more slender than usual, and terminating to appearance within the orbits.

I then saw that the tongue was very long, but not equally wide in proportion to its length. And this corresponded to the lower jaw, which was of such a length, as to extend itself beyond the upper anteriorly; though the upper was here greatly stretch'd out forwards, as it descended: and yet the right, and left, parts of the lower jaw, were at a greater distance from each other, the more they receded from the chin; as they naturally are.

Wherefore the interval betwixt the two, was longer indeed than usual, but much more narrow; and was moreover still render'd narrower, by a peculiar thickness in both of them. And at the lower part of the chin, both of them had coalesc'd into one bone; without any line being interpos'd, as generally happens in children.

And now to speak of the spine; all the vertebræ of the neck were not really wanting, but only three: yet the rest were so crowded upon each other, that certain parts of some of them were concremented into one substance with the contiguous parts of the next. And the same was seen in the two or three uppermost vertebræ of the thorax; the very bodies of which were even join'd into one substance.

From these the spine began to proceed backwards, and at the same time to be curv'd towards the left side: which incurvation, when it had reach'd almost to the vertebræ of the loins, was chang'd into a contrary direction; and thus was continued even through the os sacrum.

But the first incurvation was much more considerable than the second: wherefore the latter only lifted up the left os ilium a little; but the former rais'd

rais'd up the right scapula considerably, and made the whole series of the ribs stand out differently in that side, from what they did in the opposite side.

And there were on the right side eleven ribs only; whereas on the left there were twelve, yet the thoracic vertebræ were in all only eleven, and the lumbar six.

But what was more worthy of remark, the spine was really bifid. For the upper vertebra of the neck, and all the others after that; if you except those that are below the last but one of the loins; had all that bony matter, which is added to their bodies, in order to form a tube for the spinal marrow, collected on both sides, and expanded, in order to compose those two protuberances externally, of which I spoke above. Wherefore, as in the celebrated observation of Littre (*t*), there was no tube, and no spinal marrow in this subject.

If at any time you come to Padua, you shall see the whole skeleton curiously prepar'd by our Mediavia; whereby every thing that I have describ'd in the bones, is clearly shown.

But it would have been much more beautiful to look at, if the bones could all have been brought to that whiteness, which they have in the skeletons of other fœtusses, that I have by me in great number. Yet, although the bones are hard, and no care was omitted to procure this whiteness; what I did not think ought to be omitted in completing this observation; a certain brown and blackish colour could not be entirely remov'd from some of the bones in particular: and especially from most of the longer bones in the limbs.

And in regard to these longer bones, I think it ought not to be conceal'd, that they were of less thickness than they generally are in fœtusses of a height equal to this; but of greater length.

51. In the same year 1746, when I happen'd to pass the month of September in my native place, Philip Baroni; the great grandson of him who wrote upon the pleuropneumonia, formerly my agreeable auditor, and at that time a very experienc'd physician among his native Meldulenses, who lost him by an untimely death; sent to me an observation, together with figures, which he had made about that time; and which is similar to that propos'd just now (*u*) from Valsalva; and therefore will not be omitted in this place.

52. A monstrous girl was brought forth in the beginning of the sixth month after conception, by a woman who was in the thirty-sixth year of her age; but of a bad colour, thin, and much extenuated from great labours, which she had undergone beyond her strength; and from bad food.

And besides that she herself had very infirm health, she was likewise married to a man who was not robust, but even of a dull and heavy nature; and she asserted, that, in the months preceding this abortion, she had been terrified in her dreams, by a face very much like that which the girl had.

For, beyond the eye-brows there was no forehead or head: the nose was depress'd, the mouth gaping, the external ears contiguous to the shoulders;

(*t*) Mem. de l'Acad. R. des Sc. a. 1701.

(*u*) N. 48.

and that on the right side was very much inclin'd downwards : there was no neck, and no chin : for the face below the ears and the mouth, terminated immediately in the breast ; so that, as it was deficient in its superior part, it was also deficient in its inferior part.

The muscles of the abdomen, and the common integuments of the body, that lay upon them, did not invest the much greatest part of the antérieurs of the belly ; but a membrane that was lax, and extended into the form of a very large purse, cover'd this part : and into this membrane those muscles, and integuments, being gradually extenuated, seem'd at length to degenerate.

Within this membrane, which was pellucid by reason of its thinness, the liver and intestines were seen to be hanging outwards.

The thumb was wanting on the right side : and this hand was so bent upwards, that betwixt that and the arm was comprehended almost a regular angle. These were the appearances anteriorly.

On the back part, you might see the regio dorsalis cover'd with hairs : and at the upper part of this region, in the middle place betwixt the scapulæ, was a large and deep chink gaping like another mouth ; which was form'd by the vertebræ being open in that part.

And not much above this chink, arose from the occiput, by a broad basis, a kind of flat muscle, which being unconnected with other parts, if it were extended forwards, cover'd the eyes, and the nose, in part : but if it were carried to the posterior parts, cover'd the back quite to the loins.

And this muscle was similar to the tongue of an adult man, both in figure, and magnitude. From which you may easily conceive how small this girl was.

Although some things are wanting in this description, and those in particular which ought to have been inquir'd into by dissection ; if that had been permitted ; yet from the defect of the forehead, and the remaining part of the fornix of the cranium ; as I gather from the adjoin'd figures ; and in like manner from the foramen, or rather if you please from the chink, which was form'd by the gaping of the upper vertebræ ; I seem to myself to be sufficiently clear, that in this fœtus, as well as in that of Forli (x), with which you will compare the present observation, the cerebrum was wanting.

And indeed I had an opportunity of examining, but not of dissecting, a fœtus, at Padua, in the year 1735, whose history, which I then collected with accuracy, I will subjoin here ; not only for several reasons relating to the mother herself, but also because in that which relates to the abdomen at least, and could be seen without dissection, it comes very near to those of Valsalva, and Baroni.

53. A matron of one and forty years of age, yet in pretty good health, and the mother of many children at least ; whom she had brought forth very happily, and all of them very well form'd ; brought forth a monstrous infant.

This woman had had no appearance of her menstrua in the October last past, nor in the months after that, to the twenty-first day of June : the

(x) Vid. Epist. Anat. 20. n. 56. & seq.

belly, and the breasts, swell'd in their proper time; together with a good colour of the face, there had been a pretty good state of health.

Yet she did not think herself pregnant, because many symptoms of her former pregnancies were wanting; in particular the tumour of the belly in so great a degree as it us'd to be before; and the motion of the infant, which had hitherto been very great and continual, but was now none at all. To these circumstances was added, that, in the last months a hard and circumscrib'd tumour, like a distended bladder, was perceiv'd, for the most part, in the hypogastrium: but soon after seem'd to vanish away suddenly.

This then being the state of the case; and, in the last week before the day just now mention'd, a frequent and unusual necessity of making water, and a sense of weight about the pudenda coming on; and her breasts decreasing in their tumour three days before; and finally, on the day before, a few drops of a brown and thick humour, and in the morning of the following day, the same quantity of bloody matter, having distill'd from the genitals; labour pains came on after dinner: and she brought forth with very great ease, and without the assistance of any midwife, the membrane amnios in an entire state; for the chorion was turn'd upwards; with the annex'd placenta.

As she had us'd to be troubled with very long-continued pains for the most part, and with a slow and difficult exclusion of the placenta, she was so much the more surpriz'd at this new and very great facility; because, though she had been accusom'd to discharge a great quantity of blood, both at the time of menstruation and delivery, but a little was discharg'd at present; and but little on the following days likewise, except one.

And to finish the whole history of the mother; she rose up to her usual domestic employments, not on the thirtieth day, as at other times, but on the third, or fourth; and even soon after went from home: nor was this conduct of any injury to a woman who was in other respects not very robust: nay she was even as well as she had ever been, became impregnated afterwards, and brought forth a living and well-form'd child.

But, on the other hand, let me tell you how deform'd her present offspring was.

The secundines, as far as I could judge, did not differ from the usual appearance of nature; except that the placenta seem'd to be somewhat small, in proportion to that bulk, of the entire amnios, which was describ'd to me: for it was of the diameter of three inches and a half. In the amnios was a yellowish and turbid water, but not foetid; and the dead infant seem'd, to me, not to be less long than those generally are, that are brought forth betwixt the fifth and sixth month.

The face of it was very long, and therein a fleshy globe, in appearance, was prominent from the middle of the lower part of the forehead. Under this lay the eyes contiguous to each other; for there was no nose; not cover'd with eye-lids, but with a transparent membrane through which they were seen.

The mouth was in its proper place; but gap'd so as to show the incisor-teeth. The abdomen was open in the middle; and the intestines were push'd out from thence. The common integuments of the body were also open at the loins; but the hiatus did not descend much lower.

All the limbs were in a very bad state : the upper limbs from the elbows downwards ; for to the arms, which were very short and distorted, distorted hands were likewise added. And the inferior limbs terminated likewise in distorted feet : but the left leg was either broken, from the funiculus umbilicalis having been wrap'd very closely round it ; or was more distorted than the other parts.

54. What if the mother had been present at some horrible spectacle, or had seen something of the like kind in a picture ; or, at least, like the woman spoken of above (*y*), had dream'd of such an appearance ?

But this mother denied that she had ever seen any thing of the kind, or had even ever thought of it, waking or asleep ; or that any considerable force had been applied to her belly, during the pregnancy, either by falling, or constringing, or compressing it ; or, finally, by shaking it violently : for we have an example of this cause also in a very violent convulsive cough (*z*) : this only she confess'd, that during the whole of this pregnancy, she had been very gloomy and down-cast in her mind ; so that if we compare the gestations of these four monstrous fœtusses, and that also of Forli (*a*) one with another, it is wonderful, that the gestation of that which we describ'd in the second place (*b*), was so happy.

But as to what I said just now, as if in opposition to the powers of the mother's imagination ; I would have you understand it as coming from a man, who is by no means dispos'd, immediately to account for every monstrous appearance in fœtusses, from this power.

For many relations are extant of disorders of this kind, and particularly of that we are speaking of ; and not only in the collections of patch-work compilers, but even in the writings of illustrious men, who have first publish'd an example of these disorders ; or some one of that kind ; as seen by themselves, and others (*c*).

But if you examine the greater part of those authors, from whom these examples are produc'd, you will see how readily they are accounted for from the imagination of pregnant women ; and that when even they could be very fairly deduc'd from some external violence, a part is nevertheless assign'd to the imagination likewise.

Though I cannot approve these things ; yet, on the other hand, there are cases wherein it seems to me to be very hard to depart from that opinion, which is common to the greatest men, totally and altogether. What Boerhaave (*d*), what Van Swieten (*e*), what other grave authors of undoubted credit assert to have been seen by them that relates to this question, no one will doubt the truth of.

(*y*) N. 52.

(*z*) *Commerc. Litter. a. 1735. hebd. 9.*
n. 2.

(*a*) *Vid. n. 52. ad finem.*

(*b*) N. 50.

(*c*) *Vid. Sachs Eph. n. c. dec. 1. a. 1.*
Schol. ad obs. 135. Schroeck. dec. ead. a. 6
& 7. obs. 232 : Goth. Ben. Preuff. in Append.
ad earund. cent. 7 & 8. Ritter. Act. n. c. tom. 8.

obs. 88 : Stalpart. cent. 2. p. 1. Schol ad obs.
36 : alioque ; sed præ cæteris Haller, not. c. c.
& seq. ad Prælect. Boerhaav. §. 694. & Opusc.
Anat. VI. §. 16. not. III. & seq. & Opusc. IX.
not. 2. & seq. ad §. 3.

(*d*) *Prælect. ad Instit. §. 694.*

(*e*) *Comment. in Boerhaav. Aph. §. 1075.*
ad 2.

If any one contends that each of them might be produc'd, at other times, from some internal disorder; I shall not greatly contest it with him. But that they were, at that time, produc'd from the same place, I cannot readily allow.

A mulberry falls upon the globular part of the nose of a pregnant woman; and this woman brings forth an infant, on the globular part of whose nose a mulberry protuberates; "perfectly express'd" in its magnitude, colour, its roundish prominences, its roughness, and its very small hairs.

A caterpillar falls from a tree upon the neck of another woman, and cannot be taken away but with difficulty; and a girl is born, on the skin of whose neck, the form of a caterpillar is prominent; being of various colours, and having upright hairs; and, in a word, being so similar to a true caterpillar, that even "no egg could be more like another."

Another woman sees a beggar that has a hair-lip, is terrified at it, and brings forth a child that has its lips deform'd with fissures, of the same kind that were seen in the beggar; and even perfectly similar as to their dimensions (*f*).

Another (*g*) heard of a little girl, whose right hand was entirely without fingers; the thumb only being in its proper place, and the places of the fingers being occupied by nails prefix'd to the metacarpus: these things she thought of in herself "very much, and for a long time;" and she at length brought forth a foetus whose right hand was just in the same figure.

Nor must we conceal the case of her (*h*), who brought forth a boy without a cranium; the place of the brain being occupied by a kind of red fleshy mass; and who, having understood that two children were taken out of the water, in which they had been drown'd, without any skull, and without any brain, had excruciated herself "with that fix'd and obstinate imagination, "and with a perpetual rumination on the past evil:" nor ought she to be forgotten who (*i*), having brought forth a girl affected with the hydro-rachitis in the loins, "and having the same idea continually, and repeatedly, reviv'd "in her imagination;" at the next time of child-bearing brought forth another girl; "disfigur'd with the same kind of deformity as the first, and exactly in the same place."

Finally; to omit other observations which might be produc'd, and some which I very well know in consequence of having seen them, and to speak of one which in some measure relates to the three that I last describ'd to you; there was a woman (*k*) who brought forth a foetus which had its hands and feet incurvated upwards, and was deform'd with two tumours in particular, the one at the os sacrum, and the other under the navel, where the intestines, and the other viscera, coming out through the hiatus of the abdomen, greatly rais'd up the peritonæum, in which alone they were contain'd.

As the midwife was prudently determin'd neither to show, nor describe; to the mother a birth of this kind; the woman herself of her own accord describ'd it, saying, that she, in the middle of her pregnancy, had dream'd of

(*f*) Vid. aët. n. c. tom. 6. obs. 10.

(*g*) Commerc. Litter. a. 1632. hebdom. 20.

(*h*) Eph. n. c. dec. 3. a. 9. & 10. obs. 106.

(*i*) Salzmann. dissert. de quibusdam tumor. tunic. ext. §. 3.

(*k*) Schol. ad Preuss. obs. cit.

an infant rushing violently against her belly, which had its limbs incurvated in this manner, and was deform'd with two tumours; one anterior and one posterior; in the same manner as her foetus really was: wherefore, waking out of her sleep in a fright, she had ever after retain'd the melancholy idea of her dream.

You will perhaps then say, if you deny that this can be ascrib'd to the imagination of the mother; tell me, I beg of you, by what means these appearances can be produc'd.

But there would be too many things in physics that I must deny; if they were to be denied, because I do not understand the manner in which they are brought about.

And certainly, even you; if you are willing to confess the truth, according to your custom; do not sufficiently understand, how it has happen'd, that, after those particular imaginations, a disease was at hand which deform'd the foetus, in the same manner as the imagination had suppos'd; so that the mulberry we have spoken of, the caterpillar, the fissures of the lips, the mutilation of the fingers, and the unusual situation of the nails, that defect of the cranium and cerebrum, that disorder of the spine, that incurvation, and those tumours, not only answer'd perfectly to the imagination in their figure, and other conditions; but they even existed in the globular part of the nose, on the neck, on the right hand, on the lips, in the head, in the loins, in the limbs, on the posterior and anterior surface of the body, in such a manner as the foregoing imagination requir'd.

Perhaps you will say this happen'd by accident. And I shall readily assent to you where a certain imagination has not preceded; and the disorder does not correspond so exactly, both in figure and circumstances.

But where this has preceded, and the disorder corresponds thereto, in the manner I have said; not even you yourself, if you consider all things accurately, can entirely acquiesce in the accusation of chance; especially, if you have an eye not only to one example, but to a great number, as there are: for you will not easily suppose that chance could have been so ingenious, if I may be allow'd to speak thus, and so exact an imitator.

What is then the case? In respect to myself, in many, and even in very many, instances, I shall readily accuse chance if you please; but in some of the examples I shall rather accuse something else, which I confess I do not understand.

Now to return to the foetus which I last describ'd; the death of it was brought on either by the circulation of the blood being impeded through the funiculus umbilicalis itself; in consequence of its being bound closely round the leg; or by some very bad conformation of the internal parts, like that of the external; which naturally depriv'd it of the power of growing, and moving itself.

And the exit of the intestines from the abdomen; the blame of which is often thrown upon the rough and violent handling, and pressure of the midwives, when they deliver the infants; in this case, where there could be nothing of that kind, certainly must be attributed to the abdomen itself of the foetus never having been shut up; or at least not sufficiently shut up.

For from the original formation; as Harvey (*l*). has also seen in the embryos of perfect animals, as they call them, and as I have certainly seen in those of dogs; it is open.

And afterwards, unless the peritonæum, the muscles, and the common integuments firmly and closely shut it up, it must, without doubt, either remain open, as many have found it, and among these formerly, more than once, Boscus (*m*) (whom I do not remember ever to have seen quoted in collections of observations of this kind); or must be relax'd into a purse of the same kind with that seen by Valsalva (*n*), and Baroni (*o*): and if the covering is very thin and slender, it may easily be broken through by the very weight of the viscera.

For when it is made up of the peritonæum only, it is so thin, as even to suffer the peristaltic motion of the intestines to be seen through it; as Ruysch (*p*), who has three observations relating to disorders of this kind (*q*), has asserted.

In reading of which observations attentively, and comparing them one with another, and with those which he gave afterwards, in his answer to Bidloo (*r*); where he contends that these observations are rare; you will perhaps wish he had not previously said, without any kind of repugnance, that this disorder had been seen by him "many times," and "frequently."

But lest you should say, that all the observations of monstrous foetusses whatever, which I have produc'd above, relate to the defect of parts, I will add some which show an increas'd number of some parts; and that either with a defect of others, or without a defect of any.

One that was formerly sent to me by that very eminent physician, while living, Sebastian Trombelli, which describes, beside that disorder of the abdomen, of which I spoke just now, a great part of one infant growing to another; and that not only externally, but mix'd internally in their substances; I should very gladly have produc'd here, if I had not given it to our Vallisneri, by whom it was publish'd, in the latter end of his elaborate volume on generation (*s*). I will give you another however, in which my friend Mediavia observ'd both the disorders in some measure.

55. An infant was born at Padua, about the beginning of July, in the year 1736, of a mother who had before brought forth other healthy and living children, and brought forth others afterwards.

This child, if you look'd at it, had one disorder, which was a tumour equal to the size of a man's fist, in that part of the abdominal region, on the right side, which is call'd umbilical, and a little above the navel itself.

The tumour was destitute of skin, which, being elevated round about into a kind of border, terminated in a little prominence: Boscus (*t*), who had taken it into his head to suppose that this was caus'd by an ulcer, would have call'd it a cicatrix; as you also may call it, where you suppose the hiatus of the abdomen, to have been produc'd by some violence; and the parts in

(*l*) De generat. animal. exerc. 69.

(*m*) De facult. anat. lect. 1. in fine.

(*n*) Supra. n. 48.

(*o*) N. 52.

(*p*) Cent. obs. anat. chir. 73.

(*q*) Ibid. obs. 71. & 72.

(*r*) Respons. ad Bidl. vind.

(*s*) P. 3. c. 5. & tab. 3. 4 & 5.

(*t*) Lect. 1. Paulo ante cit.

which the hiatus is produc'd, to be retracted on one side and on the other; and explain the case nearly in the same manner as the celebrated Preussius (*u*) explains it.

The tumour was unequal, and yielded to the touch; so that it seem'd to be made up of the intestines. The infant at first neither discharg'd any thing from the intestines, nor suck'd the breast. Yet soon after it began to do both.

But what it discharg'd from the intestines was green: and the clothes were thereby stain'd with spots, which could not be wash'd out but with great difficulty; and indeed, frequently not at all. And the tumour which had been somewhat livid before, began in the mean time to be more livid, and at length to be seiz'd with a gangrene. Part of the rectimuscles, that lay under the skin, absceding, together with the surface of the tumour, the infant died on the five and thirtieth day after its birth.

The dissection of the belly show'd that this child had a double liver; one of them being in the usual situation, and rather small, though divided into very long lobes; the other larger, but shapeless: and this being join'd with the former, by the interposition of a thick membrane; annex'd to the trunk of the vena portarum, but sending its veins into the cava, below that other liver; extended itself to such a degree, as to force the peritonæum, which adher'd to it, and the tendons added thereto, outwards, and make up the tumour of which I have been speaking.

And this tumour yielded to the touch, from the yielding of the intestines; upon which this liver in part lay. But although there was a double liver, no gall-bladder appear'd any where. However the small intestines were in a natural state; but the colon was very much contracted.

56. Shall we suppose, that as two spleens are sometimes found in one body; and that even not very seldom; for I have seen it three times (*x*); so also two livers were given to this one infant? Or must we suppose the larger liver, which was prominent outwards, to have belong'd to another foetus, the other parts of whom had perish'd in the uterus?

For in that double-bodied foetus which Zambecari had dissected, and Valisneri has produc'd (*y*), the livers of both bodies seem to be join'd together by a kind of thick membrane that was interpos'd (*z*).

But shall we suppose it to have happen'd by mere accident, that the veins of the præternatural liver, should come into the same trunks, into which the veins from the liver proper to this infant open'd?

Without doubt this difficulty, which is much greater in most of the viscera of that double-bodied foetus, is one of those which have given rise to the late controversy upon the origin of monsters.

Nor were the same circumstances wanting in a calf, which was with great kindness sent to me, in the beginning of March in the year 1745, by that very respectable and learned man Jo. Dominic Lavarini, counsellor at Verona.

In this calf I should probably have observ'd many more things; and such, perhaps, as would be more worthy of being written to you; if it had not been brought first from the mountains to Verona, and from thence to Padua;

(*u*) In append. supra ad n. 54. cit.

(*y*) C. 5. ad n. 54. cit. & tab. 7. & seq.

(*x*) Epist. 37. n. 30; epist. 38. n. 34; & epist. 64. n. 2.

(*z*) Tab. 10. fig. 3 & 4.

after it had been born dead, and had the belly open'd; most of the viscera being taken out in order to preserve it the longer: and not only this but the diaphragm being cut into, and the pericardium laid open; so that, at such a distance of time, it was become less fit for dissection and accurate observation. Yet the few things I had it in my power to observe, I will set down here.

57. A two-headed calf, whose heads and necks, if you compar'd them one with another; and the remaining parts of the body, if you compar'd them with other calves naturally born; show'd scarcely any difference, when look'd upon externally; gave the following appearances after the thorax was open'd and examin'd.

The spines, as they came from two necks, continued to be two in the thorax likewise; being disjoin'd by some distance: but this distance decreas'd so much the more, in proportion as they descended the lower; so that, at length, below the thorax there were no longer two spines but one only.

And the transverse bones became shorter in the same order; and corresponding to the ribs in thickness, in breadth, and in situation, were each of them plac'd in that interval of the spines.

In the course of this interval pass'd the descending trunk of the great artery, which was very large in consequence of being made up of two joining into one, and did not send off two intercostal arteries only, but three and three in order, as far as this interval continued: for one of these arteries went to this interval itself.

Each side of the thorax was occupied by two large lobes of lungs, of which I have written to you on a former occasion (*a*); for each *aspera arteria* was divided into double bronchia, descending on each side from their proper neck.

There were two thymi also; although at first they seem'd to be join'd into one. There was, however, but one pericardium, though in it two hearts, quite disjoin'd from each other, were contain'd.

These hearts were equal to each other in size, and of the same structure both internally and externally: but they differ'd in these things; first, that as one of them was very near to the side of the other, the surface of the left, which was contiguous to the right, was so considerably hollow'd out, as to receive the natural convexity of the right, to which it perfectly corresponded: and in the second place, that both of them did not turn the same surface to the spine; but the right that which it naturally ought: and the left had that surface, which is usually turn'd to the spine, turn'd to the right heart: and that was the surface which was hollow'd out in the manner I have said.

And lest you should suspect this excavation to have been brought on by the right heart; which perhaps might have lain on the other for a long time after death; remember that this hollowness was considerable; as has been said; and know that there was such a firmness, and thickness, in the parietes of both hearts, in this calf; which was already at its full growth, and had been perfectly well-nourish'd in the uterus; that it is impossible to account for that excavation from thence.

And if not only the hearts, but other parts also, had been very firm at that time; and a most putrid smell had not been more and more troublesome; not

(*a*) Epist. 19. n. 48.

only to me who dissected, but even to those who were near me; I should have gone on, with pleasure, still to inquire into other circumstances of this monstrous formation.

However, of all the viscera which remain'd in the abdomen, I did not see that any was doubled contrary to the usual course of nature.

58. As the infelicity of birth, which is seen in the off-spring produc'd, does not only happen when it is born in a monstrous state; but also, as I have laid down above (*b*), when it is affected with some very considerable disorder; I will also hint a few things on the subject of this infelicity: I say a few things only; not because the dignity of the subject, and even necessity itself, would not require more, but because this letter has already run out to a great length.

For there are few disorders of infants, which really fall under the notice of the senses; if you compare them with the very great number of internal disorders: and these are they which destroy a great part of the human race, soon after they are born: and that so much the more easily, in proportion as all the vessels and viscera, by reason of their tender and soft state, are less fit to protect themselves against preternatural distentions and attritions; and still less to correct the disorder of any other viscus, or vessel, from whence those, or any other injuries, are communicated to them.

And to these disadvantages another very considerable one is added: I mean that physicians cannot receive narrations, or answers, from infants; so as to make them understand, in what part of the body, and with what uneasiness, they are affected; and consequently cannot know what kind of remedy it is necessary to use, in order to assuage, and diminish, this uneasiness at least; if it cannot be cur'd. Wherefore, Ballonius in particular, who excell'd in his profession, pitying the lots of infants, and tender children, has, in more than one place, admonish'd us (*c*), that as we must then deal with children, "as if with dumb patients" (who however, when adult, signify many things by nods and gestures) we ought to be the more diligent to observe all the marks of diseases that we can in them, and to prosecute them by the most prudent conjectures: and he has taught us, by his examples, both in the pleurisy, and the stone of the kidneys, not only what signs he had observ'd in living children, but also what he had found by dissection in the bodies of those that died of these disorders.

And I, in pursuance of his plan, have formerly recommended the same method in the idea of medical institutions; that art, like a convenient and friendly interpreter, may not be wanting to assist those, to whom nature has denied the power of making known their own disorders.

And if these things are necessary, even in those disorders of infants, which, in consequence of being common to adults, have symptoms that are well-known to physicians, how much more necessary will they be, in those diseases that are peculiar to infants!

59. I call those diseases of infants peculiar, which are from the peculiar intention of nature, in them, being disturb'd; as, for instance, a change of the

(*b*) N. 47.

(*c*) Vid. l. 1. consil. 76. in fine, & epidem. l.

2. consil. autumn. a. 1557. ad 8. & in annot. & consil. æst. a. 1558. ante med.

circulation in the blood, from that which was requir'd in a foetus, into that which is requir'd in a child that is born.

In the former, as you very well know, the blood was carried, from the placenta, through the umbilical vein, into the vena portarum; and from thence part of the blood, through the canaliculus venosus, into the vena cava: and from this a part goes through the foramen, which they call ovale, into the sinus of the pulmonary vein; and part into the right ventricle of the heart; and from this cavity a part through the pulmonary artery into the lungs; and finally, a part thro' the tubulus arteriosus into the great artery; from the iliac branches of which, a considerable portion of the blood was carried, through the umbilical arteries, into the placenta.

But these arteries, when the infant is already born, are tied up together with the vein of that name, and cut off; so that no blood can any longer be carried into them, nor carried back therefrom.

And the canaliculus venosus, and the tubulus arteriosus, are afterwards, by degrees, shut up; as the foramen ovale is also at length, if not quite shut up, at least generally diminish'd.

It therefore happens, that the blood does not pass into the cava, from the vena portarum, but by the hepatic roots of the cava: and as that which is carried through the cava to the heart is thrust into the pulmonary artery; so nothing can come from this tube into the great artery, which is not carried through the pulmonary vein into the left ventricle of the heart.

Add to these, the other intentions of nature at this time, that are peculiar, and necessary, for all those changes; as, for instance, that the milk must be suck'd from the breasts, swallow'd, and prepar'd in the stomach; the diaphragm must be alternately contracted and relax'd; the lungs must be open'd and dilated; the air must be drawn in, and press'd out again; and other things of this kind must take place.

Then imagine, that if any one part of the body be less proper for these new, and necessary offices; or give too great a resistance; or cause those passages which ought to be shut up, to be shut up much later than this new mode of life requires: imagine, I say, what must be the consequence, and you will readily conceive, how various, and manifold, the disorders may be that are peculiar to new-born infants.

60. I will illustrate these things, by the instance of a disease which falls under the notice of the senses. Infants are sometimes born without a palate; or are born with a fissure of the palate. Whether, in these cases, suction, or deglutition, or both, are prevented, or made much more difficult, it appears, that, by this means, the mouth is made unfit, or at least less fit, for sucking.

But as the disease is not only evident, but external, art contrives a method, either of preserving the infants for many days; or, where the disorder is less considerable, for many years, and to a long life.

You will read what has been deliver'd by those celebrated men, Maloet, and Petit (*d*): the former of whom relates that a child, born without a palate, had liv'd fifteen days, by putting milk into the mouth with a spoon; and the

latter, that some were preserv'd, who had been born with a fissur'd palate, by a goat giving it the teat of a dug half-full of milk; by the thicknes, length, and softness, of which, the fissure of the palate, and the cavity of the nostrils, were shut up at the same time: so that it was necessary to withdraw the teat every now and then, to prevent respiration being impeded.

And this was done in those, who could not have accusom'd themselves, as many others that he saw could not, to those inconveniencies in sucking, and swallowing, which are the necessary consequences of a fissur'd palate.

And with this hope of accusom'g the child to bear these inconveniences, or at least preserving it the longer, I remember that, in a similar case of an infant, born at Padua, I took care, in the mean time, to have nourishing glysters thrown up. Yet not only the disease is then manifest, as I have said, but the cause also.

And there is another disorder, that is manifest; but the cause is uncertain; as, for instance, when infants newly born are affected with a very considerable jaundice: for with a kind of slight jaundice, almost all of them are attack'd, a little after birth. And if the cause of this slight jaundice were ascertain'd, there would be, in my opinion, for the most part, some hint to lead us to a probable conjecture at least as to the cause of that more violent disorder.

I have heard some account for the more slight jaundice, from the mothers milk, which is yellowish after birth. And indeed I myself have sometimes seen this fluid to be yellowish at that time.

But supposing this to be the case even at all times; yet how has it sometimes happen'd, that I have seen those infants to be very yellow likewise, who had suck'd neither the milk of the mother, nor of any other woman, who has been lately deliver'd? Or how should it happen, that Sylvius (e) observ'd "many to have been born with a jaundice," and not only "to have had it appear upon them some time after birth?"

There are learned men also, who suppose all newly-born infants to become icteric in consequence of a coagulum being made of the first milk, which grows acid in the stomach; whereby the duodenum is distended soon after, and the bile regurgitates into the liver; and the blood, in consequence of its passage this way, being stop'd up: which causes are distinguish'd from this circumstance, that by a little rhubarb, or soap, this jaundice is gradually carried off.

But in many of those, that are born with this disorder, it is very clear that the milk had never been made acid in the stomach: and in respect to fifteen children of my own, who all became yellow soon after birth, and some of them in a considerable degree, the disorder was naturally carried off in every one of them of itself, and without the least assistance of art.

But that, in all these, the milk, which some had suck'd from their mother, and others from different nurses, had grown acid is scarcely to be suppos'd: and indeed in other infants indiscriminately, who suck so different a milk, and have so differently-constituted a stomach, we cannot reasonably suppose this to happen.

Perhaps some persons would be ready to believe, that this new aliment

(e) Prax. med. l. 1. c. 46. n. 11.

carries more of the oily particles into the blood than the liver is equal to the secretion of; if they did not then say, that the intestinal fœces were white, which is a very clear argument that the bile does not at all flow into the intestine duodenum.

How is it then? If an effect, which is common to all, must have a common cause, it is not repugnant to probability; that we ought to have our eye to the vena umbilicalis, which; whether it be consider'd as cut asunder, tied up with a thread, and necessarily bringing on some contraction in the vena portarum into which it is continued; or as depriv'd of the blood which returns from the placenta, and not assisting, by this useful additamentum, the other part which is carried through itself, and is perhaps thicken'd from the new kind of aliment; may, in either or both ways, retard the secretion of bile in the liver; till this viscus, upon the ceasing of that contraction, becomes, by degrees, accusom'd to its new mode of action, and is again fit for the separation of the bile.

However these things, as you see plainly, depend upon conjecture alone.

61. But there are other things which may be confirm'd by the dissection of infants. I remember to have read, among the remarks made by Cowper, in his Appendix to the Anatomy of the Human Body, that they in whom he found the passages I have spoken of above (*f*); that of the tubulus arteriosus, and of the foramen ovale in particular; to be shut up too early in life, had been frequently afflicted with a great number of disorders, such as inflammations of the head, neck and lungs.

Wherefore, when these disorders attack new-born infants without any previous manifest cause, it will not be absurd and unreasonable to suspect that too hasty occlusion.

And as in this case he recommends a diminution of the blood; so you may, at least, recommend the giving of milk more sparingly, and prescribe such things to the nurse, as will generate a more thin and fluxile milk.

For, by these means, the blood; which is, in its whole quantity, carried through the lungs, and rushes into the superior branches of the great artery, in so much a greater quantity in proportion, as it is carried down in less quantity into the descending trunk thereof; will pass more easily, and will do less hurt to the lungs, and the brain: from the injury of which perhaps, as being at that time very soft, other disorders, besides these inflammations, arise in the genus nervosum by which those new-born infants are frequently and suddenly destroy'd; and in particular those, in whom, besides those premature occlusions, there is already a more copious or dense blood from the uterus; and the vessels of the brain are even much more infirm, than they generally are.

And as some may be born with such a vitiated structure, that those passages of the blood, of which we have spoken, may be shut up too soon; so, on the contrary, it is reasonable to suppose that some are born, in whom there is an opposite disorder; and those passages, for that reason, are not only never wholly shut up; which has been met with by me and others frequently in the foramen ovale; but are not even diminish'd: and this you may suppose said of the same foramen ovale also.

And if some bodies are, perhaps, so form'd that they can bear these inconveniences without falling into disease, it is not, however, improbable, but there are many more which cannot.

To this subject relates a letter which was written to me on the eighteenth of May, in the year 1722, by the celebrated Jano Planci. For he inquir'd of me whether I had ever found the foramen ovale, in new-born infants, quite unfurnish'd with any valve.

The reason of his inquiry was, that, in an infant lately dissected, both he, and a gentleman whom I have before spoken in commendation of; who then liv'd at Rimini, and who was afterwards first physician to the pope; I mean Anthony Leprotti, had sought after this valve with accuracy, but in vain.

And the summary of his whole observation, as far as I have collected it from these, and the preceding letters of Planci, deserves well to have a place in this epistle.

62. An infant, who had not been born more than fifteen days, was carried off from the state of the living; but by what kind of disorder is not certain.

On examining the body, the stomach was found full of good milk; and this viscus, and all the others, appear'd to be found; except that the heart, and the vessels which are about it, were distended with blood in a surprizing manner.

Those parts of the umbilical vessels that are in the belly, and the tubulus arteriosus, were open: and the foramen ovale was not only open, but was entirely without its valve; so that not the least traces, or remains, of it appear'd, with whatever diligence you sought after it.

63. And as I wrote back to Planci, that this appearance was entirely preternatural, he naturally fell into that way of thinking, which I just now spoke of. And you certainly perceive, that where that part which the blood urges on the left side; and impells, if not to shut up the foramen ovale more and more, at least to cover it in some measure; is wanting, that certain motion of the blood, which is requir'd in breathing animals, must be perverted in the principal organ: and if this perversion, or perturbation, be not diminish'd, but continue to be still the same, the motion of the heart, and blood, must, at length, be quite suffocated.

64. You see, how very wide, and, at the same time, an almost unbeaten track, lies open to investigate the diseases of new-born infants, I mean by an attentive and accurate observation in dissection after death, as well as while they are living, if the foolish love of parents did not withstand.

Yet these very parents, having lost all their infants, one after another, in the same manner, at length offer to the physicians, of their own accord, what they had denied before; in order to try if it be possible to preserve those that may be born hereafter.

However, they frequently light on those who are either unskill'd in anatomy, or despisers of it; both of which instances I formerly saw in one and the same case. They who dissected the new-born infants, reported as their fatal disease, that appearance which is, in them, quite natural; I mean the dura mater adhering very closely to the cranium. They who were consulted, shew'd how much they had slighted anatomy, by admitting of this report,
and

and considering that very adhesion as the foundation of what they were to answer.

Yet if a diligent study of anatomy brought with it no utility besides this; that from the internal constitution of bodies, which are in a natural state, we might learn what things are natural and what præternatural, in inquiring after the causes of diseases; it certainly ought to be highly esteem'd, instead of being despis'd.

But the bodies of tender infants have many peculiarities, besides those which I have taken notice of above: so that whoever would wish to enquire into their latent diseases, to detect those appearances that are really morbid, and compare them with the symptoms which he observ'd in the children while living; and after that, according to the nature, and degree, of both, bring some alleviation if not a cure, or, if it is impossible to do this, at least to make a prediction, and confirm it by an explanation agreeable to what anatomy may teach him, ought to be exercis'd in dissections of these bodies.

Of a prediction thus explain'd; not to digress far from the cranium which we have already mention'd; there is an example in a fatal sign, which is, in other respects, not unknown, in the writings of Wepfer (g).

For, when the death of infants is at hand, I have not only seen evident, and profound, sulci, about the lambdoidal and sagittal sutures; but also a subsiding little pit near to the conjunction of the coronary and sagittal sutures.

Why so? Because the brain is then collaps'd into itself; and by subsiding draws inwards, by means of the connections of the dura mater, whatever of a membranous nature still remains in the interstices of the sutures; and consequently produces those furrows, and this pit, or cavity.

65. But it will be proper, before any diligent man attempts these things in new-born infants, to collect all the more accurate observations, and dissections, that have been made by physicians, and anatomists, upon infants more advanc'd, and upon children; for they are not extant even in the Sepulchretum, unless in a scatter'd state; and out of these, to attend principally to those which relate to the structures proper to that age; or to the remains of those structures, which particularly occur in new-born infants, and are sometimes larger than is commonly suppos'd.

Then let him afterwards add the observations which relate to these new-born infants, as many as ever he can collect of himself, or obtain from others similar to his own; and let him make one body of them all; which should begin with the infants that are the most advanc'd, and end with those that are lately born: for the former may, sometimes, by their imperfect words, or their little hands, make some discoveries, which (if you remark with what other symptoms, that naturally offer themselves, they are join'd) will frequently assist your conjectures, at the time when you happen to find these other symptoms, in those who have it not in their power to convey any meaning by their tongues, or by their gestures.

I confess I had a great desire to undertake this part of medical knowledge; but the power was wanting. For although I might have been at liberty to

(g) Exercit. de loc. aff. in apopl.

observe sick infants with some accuracy when living, yet it would not have been in my power to have dissected them after death. And the former, without the latter, would avail little to the purpose.

You will therefore expect these things from others: and from me you may still expect other letters, in relation to those diseases, where I had not only an opportunity of observing in the living subjects, but of dissecting them after death. In the mean while farewell.

END OF BOOK III.







